OPERATIONAL INTERDICTION
AN APPRAISAL OF UNITED STATES INTERDICTION DOCTRINE FOR THE OPERATIONAL LEVEL OF WAR

A thesis presented to
the Faculty of the U.S. Army Command and General Staff College
in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

JAMES WILLIAM EWING, JR., MAJ, USA
B.S., United States Military Academy, 1978

Fort Leavenworth, Kansas
1990

Approved for Public Release; Distribution is Unlimited.

AD-A227 382.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	1 June 1990	Master's Thesis, Aug 1989 to Jun 1990

4. TITLE AND SUBTITLE
Operational Interdiction, An Appraisal of United States Interdiction Doctrine for the Operational Level of War

5. FUNDING NUMBERS

6. AUTHOR(S)
Major James W. Ewing Jr.

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
U.S. Army Command and General Staff College
Attn: ATZL-SWD-GD
Fort Leavenworth, KS 66027-6900

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited

12b. DISTRIBUTION CODE
A

13. ABSTRACT *(Maximum 200 words)*

This study investigates past and current US Army and US Air Force doctrine and proposed joint doctrine for interdiction operations at the operational level of war. The investigation assesses the post-Korean Conflict role of interdiction, analyzes the current status of interdiction, and evalutates the consistency, compatibility, and conformity of current US Army, US Air Force, and proposed joint interdiction doctrine. The study concludes that the United States does not have a coherent interdiction doctrine for the operational level of warfare. Discrepancies were discovered between US Army, US Air Force, and proposed joint interdiction doctrine. They range from use of non-standard terminology to lack of recognition of an operational level of warfare. The study recommends that a standard terminology be adopted, and provides one that reflects the three levels of warfare.

14. SUBJECT TERMS	15. NUMBER OF PAGES
Doctrine, Interdiction, ~~FOFA~~	101
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
Unclassified	Unclassified	Unclassified	UL

OPERATIONAL INTERDICTION
AN APPRAISAL OF UNITED STATES INTERDICTION DOCTRINE FOR THE OPERATIONAL LEVEL OF WAR

A thesis presented to
the Faculty of the U.S. Army Command and General Staff College
in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

JAMES WILLIAM EWING, JR., MAJ, USA
B.S., United States Military Academy, 1978

Fort Leavenworth, Kansas
1990

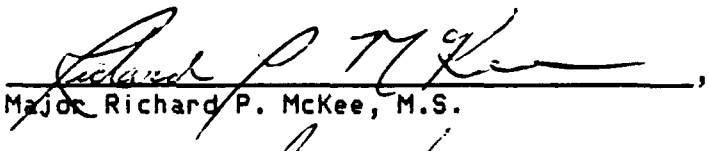
MASTER OF MILITARY ART AND SCIENCE

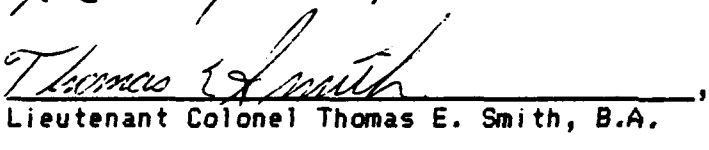
THESIS APPROVAL PAGE

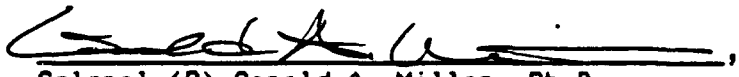
Name of candidate: Major James W. Ewing, Jr.

Title of thesis: Operational Interdiction, An Appraisal of United States Interdiction Doctrine for the Operational Level of War

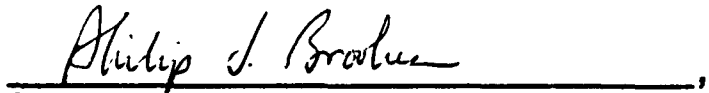
Approved by:


, Thesis Committee Chairman
Major Richard P. McKee, M.S.


, Member, Graduate Faculty
Lieutenant Colonel Thomas E. Smith, B.A.


, Member, Consulting Faculty
Colonel (P) Gerald A. Miller, Ph.D.

Accepted this 1st day of June 1990 by:


, Director, Graduate Degree Programs
Philip J. Brookes, Ph.D.

The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U. S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement)

ABSTRACT

Operational Interdiction, An Appraisal of United States Interdiction Doctrine for the Operational Level of War, by Major James W. Ewing, USA, 96 pages.

This study investigates past and current US Army and US Air Force doctrine and proposed joint doctrine for interdiction operations at the operational level of war. The investigation assesses the post-Korean Conflict role of interdiction, analyzes the current status of interdiction, and evalutates the consistency, compatibility, and conformity of current US Army, US Air Force, and proposed joint interdiction doctrine.

The study concludes that the United States does not have a coherent interdiction doctrine for the operational level of warfare. Discrepancies were discovered between US Army, US Air Force, and proposed joint interdiction doctrine. They range from use of non-standard terminology to lack of recognition of an operational level of warfare.

The study recommends that a standard terminology be adopted, and provides one that reflects the three levels of warfare.

TABLE OF CONTENTS

CHAPTER 1

INTRODUCTION

General

The role of interdiction in warfighting is changing. Once considered a single-Service mission, interdiction was planned and executed in virtual isolation from other operations. Today, all of the Services have interdiction capabilities and senior commanders go to great lengths to fully integrate interdiction with other operations. (See Appendix One: FOFA Arguments) The increased stature of interdiction is primarily due to advances in technology, conditions imposed by treaty commitments, and the formal recognition by the US military establishment of an "operational level" of war.

Advances in intelligence, targeting, and weapon system technologies dramatically increase interdiction capabilities. 1 Satellites can detect enemy movements both visually and electronically and are a vital part of modern communications networks. Manned and unmanned reconnaissance aircraft provide commanders with the ability to look at a specific area at will. Standoff electronic intelligence platforms gather additional intelligence in relative safety behind the FLOT. Computers process all of the collected information and identify

target opportunities. Target data is transmitted via modern communications systems in near "real time" to combat forces which can then engage the enemy with long range surface to surface missiles or rockets, air or sea launched cruise missiles, and/or manned aircraft. Thus, enemy forces can be detected, targeted, and engaged long before they can influence the close battle.

Recent and future US and NATO treaty commitments such as the Intermediate-range Nuclear Forces (INF) treaty and the Conventional Forces in Europe (CFE) treaty generate new interest in interdiction. The INF treaty eliminated major nuclear interdiction weapon systems -- the Pershing II and ground launched cruise missiles. The CFE treaty will significantly reduce the number of conventional forces and equipment based in central Europe by NATO and the Warsaw Treaty Organization (WTO or Warsaw Pact). Together, the two treaties dramatically affect how interdiction will be performed in Europe. Moreover, they dramatize the importance of having a viable interdiction doctrine and capability when facing a potential enemy who echelons forces in depth and has large numbers of reinforcements in close proximity. 2

Formal recognition of an operational level of warfare affects the role of interdiction even more than treaties and technology. While it is true that advances in technology are changing overall interdiction parameters, the majority of interdiction operations still comprise Air Interdiction (AI) missions flown by the Air Force. Because AI is usually targeted deep in the enemy rear, it used to be planned in

virtual isolation from other operations. However, because operational art recognizes that no activity on the modern battlefield can be planned or excuted in isolation without degrading the overall effort, AI is now planned as part of an overall effort. Operational art links the individual tactical level engagements and battles that comprise Air Interdiction to strategic objectives by integrating them into synchronized operations and campaigns.

The new prominence of interdiction is evident in US joint doctrine. Since the Goldwater-Nichols Department of Defense Reorganization Act of 1986 made the Chairman, Joint Chiefs of Staff (CJCS) responsible for developing joint doctrine for the armed forces, two publications -- the initial draft of Joint Chiefs of Staff (JCS) Publication (Pub) 3-03, Doctrine for Joint Interdiction Operations, and JCS Test Pub 3-03.1, Joint Interdiction of Follow-on Forces [Follow-on Forces Attack, (FOFA)] -- have been released as proposed joint doctrine for interdiction. When approved, they will establish interdiction as a major joint warfighting operation.

Background

The enhanced role of interdiction began to take shape in 1979, when the NATO military staff began to develop an operational concept to engage Warsaw Pact follow-on forces in the event of war. The objective of this concept, called Follow On Forces Attack (FOFA), was to delay, disrupt, divert, and destroy uncommitted, operational level, forces behind enemy lines before they could affect the outcome of the close

battle. These uncommitted forces were identified as a key source of strength or balance in a Warsaw Pact offensive operation, and therefore constituted a center of gravity to be attacked. The concept is not hailed universally, and has generated a lively debate over its value to NATO and the United States. (See Appendix One, FOFA Arguments)

It is important to note that the NATO staff developed an operational concept rather than doctrine. While the term "doctrine" is reasonably well understood, unless you have worked with the Concept Based Requirement System (CBRS), the phrase "operational concept" may not be familiar. General Donn A. Starry, former commander of the US Army Training and Doctrine Command (TRADOC) defined an operational concept as being "a description of military combat, combat support and combat service support systems, organizations, tactical and training systems necessary to achieve a desired goal." 3 He said that operational concepts should be generated when a problem was identified or a mission assigned for which no doctrine exists, or to exploit new technology. General Starry warned that operational concepts should not become doctrine until they are tested, approved and accepted. 4

Notwithstanding, the US Joint Chiefs of Staff initiated action to develop joint operational level doctrine for the interdiction of follow-on forces. The United States European Command (USEUCOM) is the lead agent for this action. JCS Test Pub 3-03.1, Joint Interdiction of Follow-on Forces (Follow-on Forces Attack, FOFA), is the product of their efforts to date.

Using General Starry's criteria for developing an operational concept and generating doctrine from it, the work on JCS Test Pub 3-03.1 raises a number of questions. Is this the first time enemy follow-on forces have been considered a problem? Is the interdiction of follow-on forces a "new" mission? Do the advances in interdiction related technology constitute "new" technology? Has the FOFA operational concept been tested, approved, and accepted? In order to answer these and related questions, US interdiction doctrine must be reviewed.

Research Question

What is United States doctrine for interdiction operations at the operational level of war?

Subordinate questions which must also be addressed include:

a. Did past US doctrine address interdiction operations at the operational level of war?

b. What, if any, is current Air Force interdiction doctrine for the operational level of war?

c. What, if any, is current Army interdiction doctrine for the operational level of war?

d. What is the status of interdiction with regard to other joint or Service operations?

e. How consistent are joint and Service doctrine publications with regards to interdiction?

f. Are Army and Air Force interdiction doctrine compatible?

g. Do Army and Air Force interdiction doctrine conform to joint interdiction doctrine?

Methodology

The thesis comprises a review and analysis of past and present doctrine that relate to interdiction at the operational level of war. As such, joint and Service doctrinal material and related articles, found primarily in the Combined Arms Research Library (CARL), were the primary sources of information. Additional material was obtained from the Air University Library, with copies provided to CARL.

Texts used by the US Army Command and General Staff College and other theses written for the Master of Military Art and Science program were also reviewed for pertinent information, however, in most cases, reference was made only to the primary source documents that were referenced in the texts or theses.

Past joint and Service doctrine dating from 1953 to the present were examined to determine the historical role of interdiction. Approved Service capstone doctrine publications were the main sources for this review.

Current joint publications were reviewed to determine what constitutes joint doctrine for operational level interdiction. Initial drafts, test publications, and JCS approved publications were scrutinized, with appropriate consideration given to their relative status.

Current US Army and US Air Force publications were also reviewed to determine what constitutes doctrine for operational interdiction for their respective Services. Given the large number of Service doctrinal publications, only a representative sample from each Service was reviewed. These samples included the respective Service capstone doctrine manuals, manuals designed to assist operational level commanders and organizations, and manuals that reflected Service doctrine for employment of weapon systems at the operational level.

After all the representative joint and Service doctrinal publications were reviewed, they were analyzed in several areas. First, the relative status of operational interdiction in joint and Service doctrines was determined. Second, the consistency of the various joint and Service doctrine publications was assessed. Third, the compatibility of Army and Air Force interdiction doctrine was established. Finally, Service and joint doctrine conformity was addressed.

Following the analysis, conclusions were presented along with recommendations for improvement. An appendix containing definitions of the various joint and Service terms and phrases used in the thesis was also provided.

Assumption

Even though recent world events greatly reduce the threat of a mid- to high-intensity conflict, the United States may have to fight against a nation or alliance that has numerically superior forces in the

theater of operations and employs them in multiple echelons. Therefore, the US military still needs interdiction doctrine.

Limitation

Air Force Manual (AFM) 2-1, Tactical Air Operations -- Counter Air, Close Air Support, and Air Interdiction, was not available. This renders the analysis of current Air Force interdiction doctrine incomplete. However, by reviewing the USAF Tactical Air Command Manual 2-1, Tactical Air Operations, which was derived from AFM 2-1, the shortfall in analysis should be minimal.

Delimitations

Classified material was not used.

Only doctrinal material available in the fall of 1989 was reviewed.

US Navy and Marine Corps doctrine were not reviewed.

Publications dealing with tactics, techniques, or procedures were not reviewed.

Current and future technologies related to interdiction operations were not addressed. Therefore determination as to whether they constitute "new" technology requiring new doctrine could not be made.

Whether the NATO FOFA concept was ever tested, what approval it received, and whether it was accepted as valid was not researched for this thesis. Therefore, a conclusion as to whether FOFA should be incorporated into US doctrine based on these criteria could not be made.

No attempt to measure how appropriate current doctrine is vis a vis a specific threat was made.

Effectiveness of past interdiction doctrine was not evaluated.

Clausewitz was not referenced!

Significance of the Study

Work on the NATO FOFA warfighting concept and joint doctrine for interdiction is still in progress. An appraisal of joint and Service interdiction doctrine does not exist in any form. This thesis fills the void, and will assist Joint Staff, unified and specified command, and Service planners.

ENDNOTES

1 Benjamin F. Schemmer, "NATO's New Strategy: Defend Forward, But STRIKE DEEP," Armed Forces Journal International, November 1982, pages 50 through 68.

2 John H. Milam and Diego A. Ruiz Palmer, "'Conventional Forces in Europe' What's in the Graphs?", and Phillip A. Karber, "The Military Impact of the Gorbachev Reductions", Armed Forces Journal International, January 1989, pages 47 through 64.

3 John L. Romjue, From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982, FT Monroe, VA, United States Army Training and Doctrine Command, 1984, page 89.

4 Ibid.

CHAPTER 2

PAST INTERDICTION DOCTRINE

General

The US military has produced volumes of doctrinal literature over the years. With regard to interdiction operations, US Army doctrine probably discussed interdiction as early as the 1923 edition of FM 100-5. This is because the Army's first real experience with "deep operations" was the interdiction campaign conducted by Brigadier General Billy Mitchell in support of the St. Mihiel and Meuse-Argonne offensives of the US First Army. 1

However, since the US gained additional experience with interdiction operations during World War II and the Korean Conflict, and considering the almost revolutionary advances in technology that occurred in the late 1940s and early 1950s, it is probably best to begin a review of interdiction doctrine with that produced in the 1950s. Doctrine from this time period is likely to be more relevant to conditions of today and may in fact still be viable. Moreover, since the US Air Force was formed as a separate Service in 1947, a review dating from the 1950s should reflect any doctrinal changes that resulted

when the Army lost direct control over its primary means of conducting interdiction operations.

Past Joint Interdiction Doctrine

There is no past joint doctrine that pertains to interdiction operations. This is because the scope and primacy of joint doctrine is a recent phenomenon. Prior to passage of the DOD Reorganization Act of 1986, the Military Departments developed doctrine independently, with virtually no constraints and little regard for the doctrine of the other departments. When Services did cooperate on the development of doctrine bi- or multi-laterally, consensus had to be reached with all the other Services before it could be labeled "joint doctrine."

A good example of Army and Air Force cooperation which resulted in multi-Service doctrine is TRADOC Pam 525-45/TACP 50-29, General Operating Procedures for Joint Attack of the Second Echelon (J-SAK). It is a blend of doctrine, tactics, techniques, and procedures for interdiction operations. Examples of doctrine that achieved "joint" status include: JCS Pub 1, The DOD Dictionary of Military and Associated Terms, JCS Pub 6, Joint Reporting Structure General Intructions, and JCS Pub 9, Defense of the United States Against Air Attack. 2 These and other joint publications provided valuable information, but because there was no demand for comprehensive joint doctrine embracing the entire spectrum of military operations, none was written.

The Goldwater-Nichols Department of Defense Reorganization Act of 1986 changed all of that. Angered by the numerous problems

encountered during the aborted 1979 hostage rescue operation in Iran and the 1983 invasion of Grenada, the Congress legislated changes to the way the Department of Defense operated. In addition to strengthening the authority of the commanders of the unified and specified commands, the legislation made the Chairman, Joint Chiefs of Staff (CJCS) "singularly responsible for 'developing doctrine for the joint employment of armed forces.'" 3

This statutory responsibility of the CJCS was expanded by DOD Directive 5100.1, "Functions of the Department of Defense and its Major Components," to include "promulgating JCS publications to provide military guidance for joint activities of the armed forces." 4

The CJCS complies with the law by tasking various Services, unified and specified commands, and Joint Staff directorates to develop specific joint doctrine on his behalf. All joint doctrine is staffed to these same organizations and is ultimately approved by the corporate body of the JCS. Fortunately, a consensus is no longer required and the CJCS may approve doctrine without unanimous support of the JCS.

Past Army Interdiction Doctrine

US Army doctrine has been revised many times over the years. The changes reflect "lessons learned" from combat, new technology, and changes in organization. One constant through all of the years was the use of Field Manual 100-5, Operations, as the capstone publication for Army doctrine.

1954

The first post-Korean War FM 100-5 was published in September 1954. It was organized into chapters which provided information about: organizations, basic branches, the exercise of command, combat intelligence, counter-intelligence, and reconnaissance operations, security operations, troop-movement, offensive operations, defensive operations, retrograde movements, special operations, and division operations.

It discussed "supporting forces" which included air forces that "...provide defensive cover over the combat zone, and serve as mid-range fire support elements against hostile field units or a very long-range weapons delivery system against rear area installations supporting hostile field forces." [5] Field Artillery was said to provide depth to the battlefield "by fire on hostile reserves and rear installations; it assists in the isolation of the battlefield by restricting movement in rear areas and by disrupting hostile command, control, and transportation facilities." [6]

Interdiction operations were addressed in both the offensive and defensive chapters. In the chapter on offensive operations, interdiction was referenced in the fire support section which said that

> [i]nterdiction operations are conducted to destroy or neutralize the enemy's military potential before it can be brought to bear effectively against Army forces, and to restrict the movement of enemy forces by disrupting his communications and supply lines. [7]

The Army commander was vitally concerned with interdiction operations that were "designed to destroy, neutralize, harass, or immobilize...enemy installations, communications facilities and units" because they had a direct effect on the close battle. 8

In the defensive operations chapter, the 1954 FM 100-5 postulated that limited interdiction and/or close air support would be available from the air forces because the enemy would incorporate a strong air offensive with a ground attack, therefore in order "[t]o preserve freedom for the defender, especially movement of the reserve, the major air effort is directed against the enemy air force." 9

1962

The next version of FM 100-5 was published in 1962. This edition covered: the relationship between strategy and military force, operational environments, the organization and characteristics of field forces, the principles of war and operational concepts, the conduct of battle, airborne and airmobile operations, amphibious operations, command of the air, unconventional warfare, military operations against irregular forces, situations short of war, and administration.

A generic label of "fire support elements" was given to manned aircraft, guided missiles, free rockets, cannon, and mortars. Fire support elements were said to "add depth to combat by counterfire and by attacking hostile reserves and rear installations; they isolate the battlefield by restricting the enemy's movement in rear areas and by disrupting his command, control, and transportation facilities." 10

Interdiction received special attention in 1962. It was addressed in a special subsection of the chapter on principles of war and operational concepts. The purpose of interdiction was identified as being to "deny or hinder the enemy use of areas or routes." 11 When successful, interdiction would restrict enemy movement and interfere with his command and control efforts. It would contribute to the overall security of the operation by "...preventing sudden and unfavorable changes in relative combat power." 12

Interdiction was accomplished by "fires, combat troops, guerilla forces and barrier and denial operations." 13 Additionally, "chemical agents and high yield nuclear weapons provide an area interdiction capability against large, poorly defined targets." 14 Since the "availability of resources and the capability of weapons systems will rarely permit complete interdiction...[their] application must be weighed against the overall requirements of the mission." 15

When planning interdiction operations, they must be timely and "concentrate on targets which have a significant effect on the combat power of the enemy forces directly opposing the command concerned." 16 Each echelon of command should plan interdiction operations, with "higher echelons integrat[ing] and expand[ing] the interdiction effect of subordinate elements." 17

1976

The next edition of FM 100-5 was published in 1976. It was very controversial because it promoted the concept of Active Defense and

allegedly reduced warfighting to mathematical equations. It also marked the first time "Air-Land (sic) Battle" was used to describe Army doctrine. 18 The manual was organized into chapters which addressed: US Army objectives, modern weapons on the modern battlefield, how to fight, offensive operations, defensive operations, retrograde operations, intelligence, the Air-Land battle, electronic-warfare operations, tactical nuclear operations, chemical warfare, NBC defenses, combat service support operations, operations with NATO, and special environments.

One of the functions of Field Artillery continued to be "interdiction and deep fires on enemy logistic installations, reserves, command posts, and communications," with the Air Force expected to "penetrate enemy air defenses and to attack reserve and reinforcing elements, fire support, command and control, and logistics." 19 The purpose of air force interdiction in the offense was limited to "attacking enemy reserves and reinforcements," but in the defense its purpose included "[d]estroying enemy second and third echelon forces before they are committed [and]...[i]nterdicting enemy supplies of ammunition, POL, and replacement fighting vehicles." 20

Tactical nuclear weapons were also targeted against the enemy second echelon. They offered a way to gain tactical advantage by

> neutralizing lead elements in the enemy second echelon and by eliminating his committed echelon's support and supporting fire systems. This...defeat[ed] the enemy tactical echelonment...[and] reduced pressure on friendly units in contact so that they...[could] contain engaged forces by conventional means and control the battle. 21

1982

The next version of FM 100-5 appeared in 1982. It was structured to address: challenges for the US Army, the Army's operational concept, the effects of terrain and weather, battlefield environments, tactical intelligence, the conduct of operations, the fundamentals of the offense and offensive operations, the fundamentals of the defense and defensive operations, retrograde operations, and breakout from encirclement.

This document introduced, or reintroduced depending on who you believe, operational art to US Army doctrine. Moreover, it formalized the concept of AirLand Battle and the interrelationship of ground and air operations on the modern battlefield. It undoubtably represented the "most important change in our doctrine since World War II." 22

As in earlier versions, it grouped mortars, field artillery, naval gunfire, and air delivered weapons under the category of fire support. It also provided information on USAF OAS -- tactical air reconnaissance, BAI, and CAS; the first time in a version of FM 100-5. 23

A "deep battle" component of AirLand Battle doctrine was envisioned which would support the commander's basic scheme of maneuver by "disrupting enemy forces in depth." 24 Whether on the defense or offense, "timely and well-executed deep actions against enemy forces not yet in contact...[were] necessary for effective operations." 25 Reference was made to US, German, and Israeli campaigns that provide historical evidence of the utility of deep operations in support of the

close battle. By reducing the enemy's closure rate, and creating periods of friendly superiority, the initiative was gained and opportunities for decisive action were presented. 26

The choice of targets were described as large in number, but given the scarcity of long-range artillery and air interdiction assets, only those targets that represent an enemy center of gravity were targeted. Nuclear weapons were described as being particularly effective when "when engaging follow-on formations or forces in depth because of their inherent power and because of reduced concerns about troop safety and collateral damage."27 Coordination for deep attacks was made between the fire support coordinator, the G-3, the G-2.

Past Air Force Interdiction Doctrine

As with Army doctrine, Air Force doctrine has changed many times over the years. It also reflects "lessons learned" from combat, new technology and changes in organization. Of interest, the Air Force operated using doctrine created for the US Army Air Forces until 1953, six years after it was separated from the Army. In March 1953, the USAF published the first of what now include eight versions of basic doctrine.

1953

The first official doctrine of the USAF was AFM 1-2, United States Air Force Basic Doctrine, released in March of 1953. It was organized into chapters which included: a review of military force as an instrument of national policy, the relationships between military forces, the principles of war, the employment of air forces, and the relationship between air power and national security. Roles and missions of the Air Force were not delineated, however, strategic bombing, air superiority, and interdiction were described.

In the chapter on employment of air forces, two types of actions were discussed: heartland and peripheral. (Note: The current AFM 1-1 Annex A, Evolution of Basic Doctrine, lists three "tasks" and includes control of the air with heartland and peripheral actions, however, the actual manual only lists the two described.) 28 "Heartland actions involve attacks against the vital elements of a nation's war sustaining resources...[while] peripheral actions include the tasks of reducing the enemy's air and surface efforts...." 29 When reducing the enemy's surface efforts, "efficient air employment should emphasize attack in depth upon the more profitable enemy lines of communications and concentrations." 30 Clearly, this type of action constitutes interdiction and reflected an understanding, perhaps intuitive, by the Air Force as to its importance in modern warfare.

1955

The next version of AFM 1-2 was released on 1 April 1955. It was organized along the same lines as its predecessor, with virtually the same chapters. As with the 1953 version, roles and missions were not specified. However, the discussion of air "tasks" found in the 1953 version was deleted, and along with it any mention of interdiction.

1959

1 December 1959 marked the release of the next edition of AFM 1-2. This version was a virtual clone of the 1955 edition. The only significant differences were the introduction of the term "aerospace" as opposed to "air" and the expanded section on the importance of "general supremacy in the aerospace." 31 As with the 1955 manual, interdiction was not mentioned.

1964

AFM 1-1, dated 14 August 1964, superceded the 1959 AFM 1-2. In addition to a number change, this manual was significantly different from earlier versions. AFM 1-1 marked the first time the various missions of the Air Force were documented. The manual was organized into chapters which detailed: the dynamics of aerospace doctrine, general characteristics and requirements of aerospace forces, and the employment of aerospace forces in general war, tactical nuclear operations, conventional air operations and counterinsurgency operations.

The chapter on general war referred to a full-scale nuclear war and therefore did not include interdiction as a mission. In the chapter on tactical nuclear operations, the "interdiction mission" is said to be "much more feasible" with small-yield nuclear weapons than with conventional weapons. "Low-yield, accurate, air-to-surface weapons permit the destruction of even those interdiction targets near population centers without destroying friendly peoples or producing other undesirable collateral effects." 32

Successful interdiction as part of conventional air operations was described as "requir[ing] large numbers of aircraft operating on a 24-hour-a-day basis over the target areas." 33 The sustained strikes were to be targeted at the enemy logistic support base in recognition of the high levels of support necessary to sustain conventional operations. 34 Interdiction was even listed as a mission in counterinsurgency operations, specifically against extended lines of communication, which "[b]ecause insurgents generally suffer from a serious shortage of weapons, ammunition, food, and other supplies ... can strike a critical blow...." 35

1971

More than seven years passed before the Air Force updated its basic doctrine. 1 September 1971 was the release date for the next version of AFM 1-1. While not a radical revision of the 1964 manual, it reflected the changes in basic US security strategy. The tasks or missions which were articulated for the first time in 1964, were

consolidated in to a single chapter in 1971. Other chapters described the dynamics of aerospace doctrine, the employment of aerospace forces in conventional air operations, low-intensity nuclear operations, and high-intensity nuclear operations, and air force special operations. Counterinsurgency operations did not make it into this edition.

In the tasks chapter, interdiction began to assume the form by which it is recognized today. Air interdiction operations were conducted to "destroy, neutralize or delay enemy ground or naval forces before they can be brought to bear against friendly forces, and to restrict the mobility of enemy forces by disrupting their lines of communication." 36 Airpower was said to assume the major role in interdiction because of its ability to range "throughout enemy territory seeking out and destroying fixed and opportune targets day or night, in all-weather conditions." 37 Air Interdiction would reduce an "enemy's personnel and materiel reserves to critical levels and seriously limit his capability to continue effective action." 38 Air Interdiction was seen as being "especially effective when conducted in coordination with a high level of ground activity which forces an enemy to consume his supplies at a rapid rate." 39

The chapter on conventional air operations also discussed interdiction. As in the 1964 manual, interdiction with conventional weapons was said to require "continual attacks on a 24-hour-a-day basis over a broad range of targets." 40 Priority emphasis was to be on targets "as close as possible to the Fire Support Coordination line." 41 With regards to nuclear operations, interdiction was not

formally identified as a mission in either low-intensity or high-intensity nuclear operations.

1975

The 1971 edition was superseded on 15 January 1975. This version condensed basic doctrine into three chapters which discussed: the role of the military instrument in contemporary conflict, characteristics, capabilities, and employment principles of aerospace forces in modern conflict.

In the chapter on modern conflict, Air Interdiction was identified as one of eight primary missions of the Air Force. The purpose of Air Interdiction remained the same as stated in the 1971 edition, however, the requirement for 24-hour-a-day attacks was omitted. Instead, the manual advised that "[a]erospace forces responsible for air interdiction (sic) must be capable of timely response to the fleeting, point, and area targets, and ranging throughout enemy territory to seek out and destroy targets." 42

This AFM 1-1 also identified four categories of conflict: strategic nuclear warfare, theater nuclear warfare, theater conventional warfare, and subtheater or localized conflict. 43 (Note: This is again contrary to the 1984 AFM 1-1 Annex A, Evolution of Basic Doctrine, which identifies the 1979 version as the one that redefined the levels of conflict.) Specific missions were not identified with the categories of conflict, however, they represented an early understanding of the yet to

be articulated three levels of war--strategic, operational, and tactical.

1979

Four years passed before the Air Force issued a revised AFM 1-1. Released on 14 February 1979, the manual was retitled "Functions and Basic Doctrine of the United States Air Force" and was presented in a markedly different format as compared to its predecessors. The new format emphasized key points in "bullets" and made extensive use of pictorals and quotes. As with the 1975 version, it was divided into three chapters covering: national power and the military instrument, functions and missions of the United States Air Force, and characteristics, capabilities, and composition of aerospace forces.

The chapter on functions and missions contained the most thorough discussion of Air Interdiction to date, and introduced the term "Battlefield Air Interdiction" to describe a subset of the Air Interdiction mission. The purpose of Air Interdiction remained the same as in the 1971 and 1975 manuals, with "disruption of enemy plans and time schedules" added. "The integration of air interdiction operations with the fire and maneuver plans of surface forces...[was] not usually required, since interdiction operations may be removed from the immediate battle area." 44 Air Interdiction was "planned and conducted as part of the unified effort of all friendly forces to attain a common objective...." 45 However, recognizing that the Air Interdiction mission "may have a direct or near-term effect on surface operations" as

targeted enemy surface forces move to engage in combat, the need for "air and surface commanders to coordinate their respective operations to insure the most effective support of the combined arms team" was identified. 46 This type of interdiction, involving coordination between ground and air commanders was identified as Battlefield Air Interdiction (BAI).

Summary

There is no past joint doctrine for interdiction operations.

Army doctrine makes reference to interdiction operations in every FM 100-5 since 1954. In fact, the definition of interdiction used in 1954 is almost exactly the same as the current one. All of the Army manuals recognize the scarcity of interiction weapon systems, and describe the importance of identifying the most important enemy targets to engage deep. In the 1962, 1976, and 1982 manuals, tactical nuclear weapons were considered to be effective in an interdiction role, especially against follow-on formations and forces in depth. The 1962 manual also called for interdiction to be planned at every echelon of command, with the higher echelons integrating and expanding interdiction efforts and effects.

Air Force doctrine first mentions interdiction in the 1953 version of AFM 1-2. However, it was not until 1964, that the Air Force listed interdiction as one of its major missions. Even as a major mission, interdiction was a low priority operation when compared to air supremacy. In the 1964 and 1971 versions of AFM 1-1, Air Interdiction

was said to require 24-hour-a-day operations in order to be successful. In 1979, a subset of Air Interdiction, Battlefield Air Interdiction, was identified. BAI was planned and conducted as part of a unified effort of all friendly forces, with Air Interdiction retaining autonomy from other operations.

ENDNOTES

1 R. Ernest Dupuy and Trevor N. Dupuy, Military Heritage of America, New York, NY: McGraw-Hill Book Company, Inc., 1956, pages 382 through 388.

2 JCS Pub 1-01, Joint Publication System (Joint Doctrine and Joint Tactics Techniques, and Procedures Development Program), Washington, D.C., The Joint Chiefs of Staff, 1989, pages V-1 through V-15.

3 Ibid., page I-2.

4 Ibid..

5 Field Manual 100-5, Opeerations, Washington, D.C., Department of the Army, 1954, page 5.

6 Ibid., page 17.

7 Ibid., page 95.

8 Ibid..

9 Ibid., page 125.

10 Field Manual 100-5, Operations, Washington, D.C., Department of the Army, 1962, page 36.

11 Ibid., pages 50 and 51.

12 Ibid..

13 Ibid..

14 Ibid..

15 Ibid..

16 Ibid..

17 Ibid..

18 Field Manual 100-5, Operations, Washington, D.C., Department of the Army, 1976, pages 8-1 and 8-2.

19 Ibid., pages 3-7 and 3-8.

20 Ibid., pages 4-8 and 5-11.

21 Ibid., page 10-12.

22 Colonel Don Holder, USA, "A New Day for Operational Art," Army, March 1985, page 22.

23 Field Manual 100-5, Operations, Washington, D.C., Department of the Army, 1982, pages 7-10 and 7-11.

24 Ibid., page 7-13.

25 Ibid..

26 Ibid..

27 Ibid., page 7-15.

28 Air Force Manual 1-2, United States Air Force Basic Doctrine, Washington, D.C., 1953, page 11.

29 Ibid..

30 Ibid., page 16.

31 Air Force Manual 1-2, United States Air Force Basic Doctrine, Washington, D.C., 1959, page 9.

32 Air Force Manual 1-1, United States Air Force Basic Doctrine, Washington, D.C., 1964, page 4-2.

33 Ibid., page 5-2.

34 Ibid..

35 Ibid., page 6-2.

36 Air Force Manual 1-1, United States Air Force Basic Doctrine, Washington, D.C., 1971, page 2-2.

37 Ibid..

38 Ibid..

39 Ibid..

40 Ibid., page 3-2.

41 Ibid..

42 Air Force Manual 1-1, United States Air Force Basic Doctrine, Washington, D.C., 1975, page 3-2.

43 Ibid., pages 3-4 and 3-5.

44 Air Force Manual 1-1, Functions and Basic Doctrine of the United States Air Force, Washington, D.C., 1979, page 2-13.

45 Ibid..

46 Ibid..

CHAPTER 3

CURRENT JOINT INTERDICTION DOCTRINE

General

Joint doctrine is developed by the Service chiefs, commanders of unified and specified commands, and directors of Joint Staff directorates. 1 While extant Service doctrine are considered when developing joint doctrine, once joint doctrine is approved by the JCS, Service doctrine must conform. 2 The JCS have directed that doctrine be developed to establish procedures for: intelligence support of joint operations, directing, planning, and executing joint military operations, directing, planning, and carrying out logistics support of joint operations, planning processes relating to the conduct of joint military operations, and command, control, and communications (C3) systems in support of joint operations. 3

Doctrine for interdiction operations is part of a series of JCS publications on operations. JCS Test Pub 3-0, Doctrine for Joint Operations, is the capstone of the series. It provides proposed "operational and organizational guidelines for the exercise of command ... and establishes a conceptual framework for the preparation and execution of both deterrence and warfighting." 4 JCS Pub 3-03, Doctrine

for Joint Interdiction Operations (Initial Draft), provides draft "guidance to bring effective force to bear on ... enemy surface military potential before its effective use against friendly forces." 5 JCS Test Pub 3-03.1, Joint Interdiction of Follow-On Forces [Follow-On Forces Attack, (FOFA)], is proposed "joint doctrine for planning and employing of joint forces in the interdiction of enemy follow-on forces." 6

JCS Test Pub 3-0

JCS Test Pub 3-0, Doctrine for Joint Operations, was released in October 1989 as a test publication. As such, it is provisional doctrine, available for use at the discretion of the commanders of the unified and specified commands. 7 The lead agent for development of the publication is the Army.

The purpose of JCS Test Pub 3-0 is to establish doctrine to "govern unified and joint operations of the armed forces of the United States." 8 It recognizes the three levels of war -- strategic, operational, and tactical -- and emphasizes the utility of each across the operational continuum. 9 While it is applicable to all joint operations down to and including joint task force level, the publication is primarily written for use at the unified and specified command level. As such it focuses on strategic theater-level actions. It is organized into chapters that cover the strategic security environment, unified operations in peacetime, unified operations in wartime, and combined operations in peace and war.

With regard to interdiction, JCS Test Pub 3-0 refers to interdiction only once. Chapter III, "Unified Actions in Wartime," recommends that when planning for and conducting a theater campaign, "[t]he CINC may continue to direct theater-wide deep reconnaissance and interdiction efforts, conduct special operations, pursue deception operations, and employ strategic psychological operations units," in lieu of delegating those missions to subordinate commanders. 10

JCS Pub 3-03 (Initial Draft)

JCS Pub 3-03, Doctrine for Joint Interdiction Operations (Initial Draft), was released in June 1989. As an initial draft, it has a lower status than a test publication, and is little more than a "strawman" for the Service and unified commands to comment on. 11 The lead agent for its development is the Air Force.

JCS Pub 3-03 (ID) is being developed to promulgate "principles for conceptualizing, planning, and conducting successful interdiction at the operational level of war." 12 Its target audience includes the commanders of the unified and specified commands and other joint force commands. The publication is organized into five chapters which provide: an introduction to operational level interdiction, five fundamental elements of interdiction, a review of conditions for successful interdiction campaigns, a discussion of the proper organization of joint interdiction operations, and guidance on planning and conducting an interdiction campaign.

The doctrine presented is described as "adaptable to widely varying situations and geographic areas in which interdiction is undertaken." 13 Moreover, it is "applicable to all wartime environments -- land, sea, and aerospace." 14 Maneuver and interdiction are described as complementary actions at the operational level. Maneuver generates predictable enemy counter maneuver activity which creates lucrative interdiction targets. Threat of interdiction deters enemy reaction which enhances the effects of maneuver, while actual interdiction prevents the effective use of enemy surface military potential against friendly forces. 15

Fundamental elements of interdiction are said to include: objectives, characteristics, geography, results, and resources. The objectives of interdiction are provided in its definition, i.e., the destruction, delay, disruption and/or diversion of the enemy. The characteristics of interdiction are its situation dependence, and delayed versus immediate results. Geography is a fundamental element of interdiction because it affects both the target and means of delivery. Finally, resources prescribe how interdiction is performed. They include: manned aircraft, unmanned aircraft, missiles and rockets, indirect land and naval fires, improved munitions, conventional and unconventional land forces, and, mines. 16

The conditions for successful interdiction campaigns listed in JCS Pub 3-03 (ID) "are a result of 'lessons learned'" from the history of interdiction operations. 17 The conditions are: availability of accurate and timely intelligence, possession air superiority, ability to

detect and identify targets, capability to sustain interdiction pressure, enemy concentration, terrain which channelizes movement, high enemy consumption rates, corresponding enemy logistical constriction, and time-urgent movement of enemy forces. 18

The publication recommends that joint interdiction should be a separate operational campaign within the overall theater campaign. This will allow for the "[s]ynchronizaton of interdiction and other operations, such as maneuver, so they reinforce and exploit each other's results...." 19 When interdiction is designated as a separate campaign, synchronizing it with other campaigns becomes the primary role of the interdiction commander.

With regard to planning, the publication emphasizes that interdiction should be focused on achieving theater or campaign objectives. As in all operational planning, neutralization of enemy centers of gravity is described as the best way to achieve these objectives. The interdiction planning and coordination cycle should:

> (1) Ensure component efforts remain synchronized.
> (2) Ensure the appropriate assets are available and applied to key targets in a timely manner.
> (3) Increase mutual support.
> (4) Reduce over-targeting and duplication of effort.
> (5) Preclude adverse effects on friendly forces.
> (6) Ensure effective operations can contiune during periods of degraded communications. 20

Finally, mission order versus specific target designation taskings are recommended for interdiction operations. A mission order tasking maximizes initiative at lower levels, ensures appropriate tactics and techniques are employed, and generates a better

understanding of the overall campaign objectives at lower levels of command, which in turn facilitates continuity of effort in the event of degraded communications or casualties. 21

JCS Test Pub 3-03.1

JCS Test Pub 3-03.1, Joint Interdiction of Follow-on Forces [Follow-on Forces Attack (FOFA)], was released as a test publication on 16 June 1988. The publication is proposed operational level doctrine that describes how to "break the momentum of the follow-on forces of attacking enemy echelons before they become engaged with US defending ground forces in close operations." 22 It is organized into six chapters that: describe FOFA, provide operational considerations for FOFA, review command and control arrangements, discuss planning and coordination, explain FOFA targeting, and ultimately, how to employ FOFA operations.

The publication identifies joint interdiction of follow-on forces as a "subset of the theater interdiction campaign directed against enemy land forces." 23 Follow-on forces are said to consist of uncommitted enemy ground forces not yet in the close battle, all of their support elements, the command and control communications apparatus needed to control them, and the locations that all of these forces and organization use to move and operate from. 24 Follow-on forces may be distributed throughout the enemy rear areas; from the immediate rear of forces in contact all the way back to the enemy homeland.

FOFA lists friendly and enemy operational considerations for employment. Enemy considerations include the capabilities of enemy forces in contact and their follow-on forces, and overall enemy vulnerabilities. Friendly considerations include force availability and capability. The same resources listed in JCS Pub 3-03 (ID) for interdiction operations are also listed for FOFA. 25

With regard to command and control of FOFA, the publication recommends that the joint force air component commander (JFACC) be responsible for coordinating and deconflicting interdiction for all elements of the joint force. 26 This will ensure the integration of FOFA operations into the overall interdiction effort. Moreover, it recognizes that USAF Air Interdiction currently constitutes the preponderance of US capability to conduct FOFA-type operations.

Planning and coordination requirements for FOFA operations are "unique" according the publication. Unlike other interdiction operations, FOFA operations "must be flexible, responsive, and dynamic because there will be only narrow and fleeting windows of opportunity." 27 Otherwise, the planning and coordination cycle for FOFA is the same as the one used in JCS Pub 3-03 (ID).

With regard to targeting of follow-on forces, JCS Test Pub 3-03.1 describes the vulnerabilities of enemy movement and logistics operations. Additionally, timing is described as an enemy vulnerability, as the disruption of his momentum seriously degrades his overall plan and creates confusion. All three must be considered when

targeting FOFA operations, with timely intelligence being a critical factor.

The publication describes employment considerations for FOFA operatons that reflect its inherently joint nature. Various control measures must be implemented to define areas of responsiblity. Coordination between components is required to deconflict overlapping responsibilities. Component efforts must be integrated and synchronized in order to maximize the synergisitc effect.

Finally, the logistics effort to support FOFA must be closely monitored and controlled. Enemy vulnerabilities can not be exploited without the logisitic support needed to operate FOFA systems and forces.

Summary

There is no approved joint doctrine for interdiction at the operational level of war. JCS Test Pub 3-0 does not discuss interdiction or its relationship to other operations, but does recommend that the theater commander personally direct interdiction efforts. JCS Pub 3-03 (ID) and JCS Test Pub 3-03.1 will establish doctrine for joint interdiction at the operational level of war. JCS Pub 3-03 (ID) will provide guidance for comprehensive intrdiction of land, air, and naval targets. JCS Test Pub 3-03.1 will provide guidance for focused, short-term interdiction of ground targets. Each recommends that interdiction be a separate campaign within the overall theater campaign, with JCS Test Pub 3-03.1 recommending that the JFACC be designated as the overall interdiction commander for the theater.

ENDNOTES

1 JCS Pub 1-01, Joint Publication System (Joint Doctrine and Joint Tactics Techniques, and Procedures Development Program), Washington, D.C., The Joint Chiefs of Staff, 1989, pages I-3 and I-4.

2 Ibid., page I-4.

3 Ibid., page V-1.

4 JCS Test Pub 3-0, Doctrine for Joint Operations, Washington, D.C., The Joint Chiefs of Staff, 1989, page i.

5 Ibid., page I-1.

6 JCS Test Pub 3-03.1, Joint Interdiction of Follow-On Forces [Follow-On Forces Attack, (FOFA)], Washington, D.C., 1988, page I-2.

7 JCS Pub 1-01, op cit, page III-3.

8 JCS Test Pub 3-0, op cit, page i.

9 Ibid., page I-14.

10 Ibid., pages III-12 through III-20.

11 JCS Pub 1-01, op cit, page III-2.

12 JCS Pub 3-03 (ID), Doctrine for Joint Interdiction Operations, (Initial Draft), Washington, D.C., The Joint Chiefs of Staff, 1989, page I-1.

13 Ibid..

14 Ibid..

15 Ibid., page I-3.

16 Ibid., pages II-1 through II-10.

17 Ibid., page III-1.

18 Ibid., pages III-1 through III-5.

19 Ibid., page IV-2.

20 Ibid., pages V-2 and V-3.

21 Ibid., pages V-5 and V-6.

22 JCS Test Pub 3-03.1, op cit, page I-1.

23 Ibid..

24 Ibid., page I-3.

25 Ibid., pages II-1 through II-6.

26 Ibid., page III-3.

27 Ibid., page IV-1.

CHAPTER 4

CURRENT ARMY INTERDICTION DOCTRINE

General

US Army fundamental doctrine is articulated in FM 100-5, Operations, which "provides guidance for operational and tactical level employment of US Army units worldwide." 1 It is called AirLand Battle doctrine (ALB) in "recognition of the inherently three-dimensional nature of modern warfare." 2 ALB predicts that "high- and mid-intensity battlefields are likely to be chaotic, intense, and highly destructive...extend[ing] across a wider space of air, land, and sea than previously experienced." 3 Moreover, "[a]ll ground actions above the level of the smallest engagements will be strongly affected by the supporting air operations of one or both combatants." 4 The Army describes ALB as "the condensed expression of its approach to fighting campaigns, major operations, battles, and engagements." 5 Tactics, techniques, organizations, support structure, equipment and training for the Army are all derived from ALB.

Although ALB does not specifically address interdiction, interdiction-type operations are an integral part ALB. Interdiction-type operations at the operational level of war are

discussed in FM 100-5, the coordinating draft of FM 100-6, Large Unit Operations, and FM 6-20, Fire Support in the AirLand Battle.

FM 100-5

The most current edition of FM 100-5 was released on 5 May 1986. It is organized into chapters which address: the challenges for the US Army, the fundamentals of AirLand Battle doctrine, operational and tactical planning and execution, sustainment planning and execution, the environment of combat, the fundamentals of the offense, conducting offensive operations, the fundamentals of the defense, conducting defensive operations, retrograde operations, joint and combined operations, and finally, contingency operations.

AirLand Battle doctrine envisions future battles as being nonlinear. Deep, close and rear operations will be conducted simultaneously. Deep operations are defined as activities at any echelon "directed against enemy forces not in contact designed to influence the conditions in which future close operations will be conducted." 6 Deep operations are conducted at the operational level "to isolate current battles and to influence where, when, and against whom future battles will be fought." 7

FM 100-5 acknowledges that deep operations "are not new to warfare nor to the American Army...[and] the concept of interdicting the enemy's supplies, follow-on forces, reserves, and communications...is a familiar feature of modern war." 8 It asserts that numerous examples of deep operations can be found in recent military history. "The principal

difference in such operations today is the increasing availability of means to conduct them at the tactical as well as the operational level." 9

The manual cautions that while the means to conduct deep operations are increasingly available, they cannot be squandered. Therefore, "...deep operations must be focused against those enemy capabilities which most directly threaten the success of friendly operations. These must be attacked decisively, with enough power to assure the desired impact." 10

FM 100-5 describes how at the operational level, commanders synchronize ground, air and sea operations to establish favorable terms for battle. Since large scale ground maneuver is vulnerable to enemy air, and occasionally, sea forces, operational commanders must "conduct reconnaissance, interdiction, air defense, and special operations almost continuously." 11

With regard to air operations in support of ground operations, FM 100-5 affirms that the "first consideration in employing air forces is gaining and maintaining the freedom of action to conduct operations against the enemy," in other words, establish air superiority first. 12 Once air superiority is achieved, air forces can be employed to disrupt the momentum of enemy attacks and destroy his land forces. "Air forces must attack not only those enemy forces in contact, but enemy forces held in reserve or rear echelons as well." 13

Close Air Support and Air Interdiction (AI) are described in FM 100-5 as the means by which the Air Force will carry out attacks against

the enemy land forces. "Air Interdiction operations delay, disrupt, divert, or destroy an enemy's military potential before it can be brought to bear effectively against friendly forces." 14 Because interdiction is usually conducted at great distances from friendly surface forces, the "detailed integration of specific actions with the fire and movement of friendly forces is normally not required." 15 Targets of interdiction include: enemy surface forces, movement networks (including lines of communication), command, control, and communications (C3) networks, and combat supplies.

FM 100-5 identifies Battlefield Air Interdiction (BAI) as a subset of AI and this time the definition is verbatim with the Air Force. BAI consists of "attacks against targets which are in a position to have a near term effect on friendly land forces." 16 The primary difference between BAI and Air Interdiction is the "level of interest and emphasis the land commander places on the process of identifying, selecting, and attacking certain targets." 17 Because of this interest, joint coordination at the component level is required during planning.

FM 100-6 (CD)

The coordinating draft of FM 100-6, Large Unit Operations, was released on 30 September 1987. It "establishes doctrine for the operation and functioning of organizations between the strategic and tactical levels in war," i.e., at the operational level war. 18 The manual recognizes that situations that require large Army formations will involve joint, and probably combined operations. It is organized

into chapters that address: the operational environment, the structure of military operations, the elements of operational design, campaigns, army groups, and theater armies.

Chapter 3, "Elements of Operational Design," argues that "functions traditionally associated with tactical operations have analogues at the operational level...[t]hey are intelligence, maneuver, fires, sustainment, and deception." 19 Fires are said to be operational when "their application constitutes a decisive impact on the conduct of a campaign or major operation." 20 While the surface delivery systems of the future will be suitable for operational employment, "[t]oday, operational fires are largely the province of theater air forces." 21

The manual then identifies general tasks of operational fires and provides historical examples of each. The general tasks are:

> o Facilitating maneuver to operational depths by the creation of an exploitable gap in the tactical defense;
> o Isolating the battlefield by the interdiction of uncommitted enemy forces and sustaining effort; and
> o Destroying critical functions and facilities having operational significance 22

The use of carpet bombing, such as that employed at the Normandy beachhead in World War II, and the use of "fire strikes" by the Soviets on the Eastern Front in the Vistula-Oder operations are used to illustrate the first general task. The BAI operations used to isolate the battlefield during the Normandy breakout, Operation Strangle in Korea, and the Lam Son Operations in Vietnam are offered as examples of the second task. Finally, the counter-air operation in European Theater in 1944 is offered as an example of the third task.

A caveat is made with regard to the first two tasks. In order to be operationally significant, "interdiction, whether by air or surface fires, must be combined with other operations." 23 The primary contribution of interdiction is the curtailment of the enemy's freedom of movement not the attrition of his forces. Interdiction that slows the reaction of enemy reserves, obstructs the redeployment of forces from other areas, delays the concentration of enemy forces, and/or separates successive attack echelons, disrupts enemy operations and hastens his culmination. Ultimately though, interdiction is only valuable to the friendly force if it can be exploited by other means.

FM 6-20

The current version of FM 6-20, Fire Support in the AirLand Battle, was released 17 May 1988. It is the Army's "capstone manual for fire support." 24 It establishes the principles of fire support and describes the fire support system of ALB. And, although ALB is relatively new, the "underlying principles of supporting the maneuver arms with fire and giving depth to the battle have origins which are rooted deep in the universal military experience." 25

FM 6-20 is organized into 3 chapters which establish the foundations of fire support, enumerate the components of the fire support system, and describe fire support planning and execution. The chapter on the foundations of fire support lists AI, BAI, and long range rocket and missile fires as the means to conduct fire support at the operational level. The purpose of fire support at the operational level

is to "destroy, neutralize, or suppress high-payoff targets affecting the outcome of a campaign or major operation." 26

The chapter on components of the fire support system lists field artillery, mortars, naval gunfire, tactical air, Army aviation, electronic warfare, nuclear weapons, and chemical weapons as a fire support resources. One of the roles of field artillery is to deliver interdiction fires. These fires are used to "disrupt, delay, and destroy enemy forces that, because of range limitations or intervening terrain, cannot fire their primary weapon systems on friendly forces." 27 These enemy forces include first-echelon forces not part of the close battle, and follow-on echelons.

FM 6-20 recognizes "interdiction" instead of AI as a basic tactical air force role. 28 This is because it describes AI and BAI as roughly coequal subsets of interdiction in general. Interdiction is defined as a mission to "destroy, neutralize, disrupt, or delay an enemy's military potential before it can be effectively brought to bear against friendly forces." AI is defined as "an operation directed against targets that are not near friendly forces and will not have an near-term effect on the ground commander's scheme of maneuver," while BAI is defined as "attacks against targets that are in position to have near-term effect on friendly forces." 29

The chapter on fire support planning and coordination describes deep fires as "the most responsive assets the operational-level commander has to disrupt Threat operations." 30 However, targeting "will almost exclusively be focused on planned engagements...one in

which some degree of prearrangement (such as general target location, weapon system positioning, and munition selection) has been made." 31

When planning deep fires, the commander should designate as targets "[o]nly those enemy force elements which can be brought to bear against significant projected friendly operations or those which are essential to the accomplishment of critical Threat functions." 32 Ultimately, in order for operational fires to provide the ability "to react to situations and opportunities more rapidly than the Threat...[w]e must be able to operate inside the Threat decision cycle." 33

Summary

The Army does not have a doctrinal publication devoted exclusively to interdiction. FM 100-5 does not even use the term "interdiction", however, the "deep operations" of ALB are virtually identical to the interdiction operations described in JCS Pub 3-03 (ID), and reflect the great importance the Army places in interdiction. Deep operations are inextricably linked to close and rear operations and are of vital importance to the overall success of land campaigns. FM 100-6 (CD) and FM 6-20 also reflect the importance the Army places in deep operations. FM 100-6 (CD) provides guidance for the conduct of major operations and campaigns. It introduces yet another phrase to describe interdiction operations -- operational fires. At the operational level, interdiction in the form of operational fires are vital to operational maneuver. FM 6-20 provides guidance for fire support operations at the

tactical and operational levels of war. It describes interdiction as a subset of operational fires. Both FM 100-6 (CD) and FM 6-20 call for a synchronized effort with regard to the employment of operational fires assets.

ENDNOTES

1 Field Manual 100-5, Operations, Washington, D.C., Department of the Army, 1986, page 161.

2 Ibid., page 9.

3 Ibid., page 2.

4 Ibid., page 9.

5 Ibid., page 6.

6 Field Manual 100-5, 1986, op cit, page 19.

7 Ibid..

8 Ibid..

9 Ibid., page 20.

10 Ibid..

11 Ibid., page 28.

12 Ibid..

13 Ibid..

14 Ibid., page 48.

15 Ibid..

16 Field Manual 100-5, 1986, op cit, page 49.

17 Ibid..

18 Field Manual 100-6, Large Unit Operations(Coordinating Draft), Washington, D.C., Department of the Army, 1987, page i.

19 Ibid., page 3-7.

20 Ibid., page 3-13.

21 Ibid..

22 Ibid., page 3-14.

23 Ibid.. page 3-16.

24 Field Manual 6-20, Fire Support in the AirLand Battle, Washington, D.C., Department of the Army, 1988, page v.

25 Ibid..

26 Ibid., page 1-6.

27 Ibid., page 2-8.

28 Ibid., page 2-12.

29 Ibid., page 2-13.

30 Ibid., page 3-10.

31 Ibid., pages 3-10 and 3-11.

32 Ibid., page 3-10.

33 Ibid., page 3-11.

CHAPTER 5

CURRENT AIR FORCE INTERDICTION DOCTRINE

General

The US Air Force has a markedly different approach to doctrine from the US Army. The Air Force articulates "aerospace doctrine at different level and depths of detail in the forms of basic, operational and tactical doctrine." 1

Basic doctrine "states the most fundamental and enduring beliefs which describe and guide the proper use of aerospace forces in military action." 2 Air Force Manual (AFM) 1-1, Basic Aerospace Doctrine of the United States Air Force, provides this basic doctrine. As such, it "is the cornerstone doctrinal manual and also provides the framework from which the Air Force develops operational doctrine." 3

Operational doctrine "applies the principles of basic doctrine to military actions by describing the proper use of aerospace forces in the context of distinct objectives, force capabilities, broad mission areas, and operational environments." 4 The AFM 2- series of manuals provide the "detailed mission description and methods for preparing and employing aerospace forces." 5

Tactical doctrine "applies basic and operational doctrine to military actions by describing the proper use of specific weapon systems to accomplish detailed objectives." 6 Primarily concerned with tactics, techniques and procedures, the AFM 3- series of manuals consider tactical objectives, conditions, and how specific weapon systems are employed to achieve a tactical objective.

Interdiction is a major mission of the USAF. As such, it is discussed in many Air Force doctrinal publications. The capstone doctrine of the USAF, AFM 1-1, discusses interdiction in fundamental terms and in context with all of the other missions of the Air Force. Tactical Air Command Manual (TACM) 2-1, Tactical Air Operations, articulates Air Force operational doctrine and provides insight into how interdiction is planned and executed.

AFM 1-1

The most current edition of AFM 1-1 was released on 16 March 1984. It has a different title from the 1979 edition that was reviewed in Chapter 2. AFM 1-1 is now titled "Basic Aerospace Doctrine of the United States Air Force". Other changes were made to include the elimination of pictorals and marginal "bullets" found in the 1979 version, and a new seven inch by ten inch size that is unique among joint and Service doctrinal publications and manuals. It is organized into four chapters which describe: the military instrument of national power, employing aerospace forces, missions and specialized task of

aerospace forces, and organizing, training, equipping, and sustaining aerospace forces.

One of the topics discussed in Chapter 2, "Employing Aerospace Forces," is the importance of attacking an enemy's warfighting potential. Such attacks include "actions against the will of an enemy and actions to deny him the time and space to employ his forces effectively." 7 Attacking the enemy in depth, in both the strategic and tactical arenas, is a requisite for success. Tactically, the "air commander must attack not only those enemy forces in contact, but enemy forces in reserve or rear echelons as well." 8 In addition to attacking enemy forces directly, movement networks and command and control structures are also targets for deep attacks. Air and surface commanders are charged with coordinating interdiction efforts to maximize the synergistic effects of their actions. When such coordination has been effected, "surface forces can...take advantage of forecast enemy reactions." 9 Furthermore, "...air and surface commanders must remain committed to their coordinated actions and must not allow the full impact of aerospace power to be diverted away from the main objective." 10

Chapter 3, "Missions and Specialized Tasks," identifies nine fundamental missions of the Air Force: Strategic Aerospace Offense, Strategic Aerospace Defense, Counter Air, Air Interdiction, Close Air Support, Special Operations, Airlift, Aerospace Surveillance and Reconnaissance, and Aerospace Maritime Operations. The objectives of Air Interdiction are: "to delay, disrupt, divert, or destroy an enemy's

military potential before it can be brought to bear effectively against friendly forces." 11 Because interdiction is usually conducted at great distances from friendly surface forces, the "detailed integration of specific actions with the fire and movement of friendly forces is normally not required." However, the air commander is encouraged to coordinate interdiction with the surface force commander. 12 Targets of interdiction include: enemy surface forces, movement networks (including lines of communication), command, control, and communications (C3) networks, and combat supplies.

Battlefield Air Interdiction is designated a subset of Air Interdiction, involving "attacks against targets which are in a position to have a near term effect on friendly land forces." 13 The primary difference between BAI and AI is the "level of interest and emphasis the land commander places on the process of identifying, selecting, and attacking certain targets." 14 Because of this interest, joint coordination at the component level is required during planning.

TACM 2-1

Tactical Air Command Manual (TACM) 2-1, Tactical Air Operations, is published by Headquarters, Tactical Air Command as a "single source document delineating the missions/functions/activities of all tactical air missions and supporting activities...." 15 It describes the purpose of tactical air operations as being:

> to gain and maintain air superiority...inhibit movement of enemy forces...seek out and destroy enemy forces and their supporting

> installations...[and] directly assist ground or naval forces to achieve their immediate operational objectives. 16

Moreover, it describes how the primary tactical missions of the Air Force, Counter Air, Air Interdiction, Close Air Support, Tactical Airlift, Air Reconnaissance and Special Air Operations, are integrated into a coherent scheme of tactical air operations.

Chapter 4, Combat Air Operations, is subtitled "The Air-Land Battle." It is divided into sub-sections which address each of the USAF primary tactical missions.

The sub-section on interdiction establishes the purpose of interdiction as being "to destroy, neutralize, confuse or delay enemy ground forces." 17 The targets of interdiction include enemy transportation systems, forces and supplies along these routes, communication facilities and supply sources.

According to the manual, an interdiction program is initiated by a Joint Force Commander (JFC), who describes "the general interdiction area, the degree of neutralization required, when the effects are desired, and the relative priority of the tasks." 18 The Joint Force Air Component Commander (JFACC) executes the integration program. Because interdiction strikes are not normally conducted near friendly forces, detailed integration of each mission with the fire and movement of friendly ground forces is not required.

The exception to this is said to involve strikes against "deeply echeloned (Soviet armored) forces directed at a narrow section of friendly defenses to force a breakthrough and exploit the

penetration." 19 Operations such as these constitute "Battlefield Air Interdiction" (BAI) which bridges the gap between Close Air Support and Air Interdiction and does require coordination between the air and ground component commanders.

TACM 2-1 advises that in addition to normal air force tactical assets, interdiction can be performed by strategic bombers employed in a conventional role. 20 Ultimately, as with most other operations,the key to successful interdiction is timely and accurate intelligence. Enemy vulnerabilities must be detected before they can be targeted.

Summary

Like the Army, the Air Force does not have a doctrinal publication devoted exclusively to interdiction. The Air Force accepts interdiction as a major mission, which is reflected in its doctrine. AFM 1-1 establishes the importance of interdiction when it states that attacking the enemy in depth is a requisite for overall success of a campaign. The objectives of Air Interdiction are the same as those of generic interdiction -- delay, disrupt, divert, and destroy enemy military potential before it can be brought to bear against a friendly force. Because AI is conducted in depth, little if any coordination with friendly ground forces is required. TACM 2-1 provides guidance for interdiction operations at the tactical and strategic levels of war. It calls for the JFACC to command the overall theater interdiction effort, and except for BAI, does not recognize a need for close coordination of interdiction operations with friendly ground maneuver forces.

ENDNOTES

1 Air Force Manual 1-1, Basic Aerospace Doctrine of the United States Air Force, Washington, D.C., Department of the Air Force, 1984, page v.

2 Ibid..

3 Ibid., page vi.

4 Ibid..

5 Ibid..

6 Ibid.

7 Air Force Manual 1-1, Basic Aerospace Doctrine of the United States Air Force, 1984, op cit, page 2-13.

8 Ibid..

9 Ibid., page 2-14.

10 Ibid..

11 Ibid., page 3-3.

12 Ibid..

13 Ibid., page 3-4.

14 Ibid..

15 Tactical Air Command Manual 2-1, Tactical Air Operations, Langley Air Force Base, VA, United States Air Force Tactical Air Command, 1978, page i.

16 Ibid., page 1-1.

17 Ibid., page 4-30.

18 Ibid., page 4-31.

19 Ibid..

20 Ibid., page 4-33.

CHAPTER 6

ANALYSIS

General

The preceeding chapters provided a review of various joint and Service publications dealing with interdiction. This chapter will analyze those publications in order to: ascertain what the relative status of operational interdiction is in joint and Service doctrine, assess how consistent the publications are with regard to the definition and status of interdiction, establish the compatibility of Army and Air Force interdiction doctrine, and determine how well the Service doctrine conforms to proposed joint doctrine.

Status of Operational Interdiction

The three joint doctrine publications reviewed, JCS Test Pub 3-0, JCS Pub 3-03 (ID), and JCS Test Pub 3-03.1, do not attempt to rank interdiction in a formal heirarchy of joint missions or operations. However, considering that two of the three are devoted exclusively to interdiction at the operational level of war the assumption can be made that the JCS consider interdiction a key element of joint warfighting.

The three Army doctrine publications reviewed, FM 100-5, FM 100-6 (CD), and FM 6-20, also fail to identify a formal status of

operational interdiction with regard to other missions. As with joint doctrine, no heirarchy of roles or missions is provided in Army doctrine. The Army does not have a field manual devoted exclusively to interdiction operations. For that matter, none of the publications even use the current definition of interdiction. However, each does recognize interdiction-type operations as key to the success of major operations at both the tactical and operational levels of war.

The Air Force manuals reviewed, AFM 1-1 and TACM 2-1, are the only doctrinal literature that actually appear to proscribe a heirarchy of missions. Both describe interdiction as being critical to the overall success of campaigns. At the Service level, Air Interdiction apparently ranks fourth after Strategic Aerospace Offense, Strategic Aerospace Defense, and Counter Air Operations. Within the Tactical Air Command, Air Interdiction appears to rank second after Counter Air Operations. The difference in apparent priority reflects the strategic focus of the Department of the Air Force and the tactical focus of the Tactical Air Command. If the Air Force does not want to infer a heirarchy of missions, it needs to alter the format of manuals that deal with missions, or clearly state that no ranking is intended when missions are provided in list format.

Doctrinal Consistency

The three joint publications reviewed are reasonably consistent with regard to definitions and descriptions of operational interdiction. JCS Pub 3-03 (ID) and JCS Test Pub 3-03.1 are very consistent, which

should not be surprising considering the latter was released more than a year prior to release of the former. Each describes the synergy of interdiction and close operations and emphasizes the importance of synchronizing them. Both list a wide variety of weapon systems that can perform interdiction and recommend the JFACC as the overall interdiction commander. The major differences involve command and control, focus and execution of interdiction operations. JCS Test Pub 3-0 recommends that the JTF commander personally direct interdiction operations, JCS Pub 3-03 (ID) wants interdiction to be a separate campaign within the theater of war but does not recommend a commander, and JCS Test Pub 3-03.1 recommends that the JFACC of the theater should command a separate interdiction campaign in the theater. With regard to focus, JCS Test Pub 3-0 does not really discuss interdiction operations, JCS Pub 3-03 (ID) describes a "generic" interdiction, applicable for air, land, and sea, and JCS Test Pub 3-03.1 is designed for land applications only. Similarly, JCS Pub 3-03 (ID) is concerned with "pre-planned" interdiction operations, while JCS Test Pub 3-03.1 advocates flexibility and "immediate" interdiction. Since JCS Test Pub 3-03.1 is a subset of JCS Pub 3-03 (ID) these differences are acceptable.

The Army publications are also reasonably consistent with each other. FM 100-5 establishes the important role of deep operations in AirLand Battle doctrine which is also reflected in the other two manuals. All three stress the importance of synchronization, which is described as a "basic tenet" of ALB. All describe the importance of focusing deep operations at targets which most directly threaten

friendly operations, and in a way which can be exploited by other means. The major differences between the manuals involve definitions and coordination. FM 6-20 does not use the same definition of Air Interdiction as FM 100-5 and FM 100-6 (CD). It uses the term interdiction to define a role and lists Air Interdiction and Battlefield Air Interdiction as subsets. FM 100-5 does not call for coordination of AI with ground operations, while both FM 100-6 (CD) and FM 6-20 do. These differences are not all that significant and reflect the different release dates or age of the manuals.

The Air Force manuals are consistent. The higher status of interdiction in TACM 2-1 reflects the tactical orientation of the manual compared to the strategic orientation of AFM 1-1 and is not contradictory. Each publication affirms the importance of attacking the enemy in depth. And while each stresses the importance of coordinated air and ground actions directed toward a single main objective, neither recognize a need to integrate AI with friendly fire and maneuver. AFM 1-1 provides a list of interdiction targets which corresponds to that found in TACM 2-1. The only significant difference between the two manuals is that AFM 1-1 does not identify who should be in charge of the overall interdiction effort, while TACM 2-1 recommends the JFACC. As with interdiction status, this probably is due to the higher focus of AFM 1-1 compared to TACM 2-1.

Army and Air Force Doctrine Compatibility

Army and Air Force doctrine for interdiction operations are remarkably compatible and even complementary in many ways. This is a result of the close cooperation between the two Services which has even generated multi-Service doctrine, such as J-SAK described in Chapter 2. TACM 2-1 even anticipated the adoption of AirLand Battle doctrine by the Army when it used the phrase "air-land battle" in 1978 to describe modern warfare.

Except for FM 6-20, all of the manuals reviewed use the same definitions of Air Interdiction and Battlefield Air Interdiction. None of the manuals use the current joint doctrine definition of interdiction. All of the manuals stress the need for close coordination between the air and ground commanders with regard to Air Interdiction. In fact, AFM 1-1 goes even further than FM 100-5 by stating that the air commander will normally coordinate interdiction operations with the surface force commander even if they are independent of the ground campaign. The Army stresses the importance of air superiority and the counter air effort in all of its manuals in consonance with the fundamental Air Force position.

The major difference in the doctrine of the two Services is the lack of formal recognition of the operational level of warfare by the Air Force. By not using the three levels of warfare in its doctrine, the Air Force has created a situation which requires interpolation of their various doctrinal material to address the operational level, which

can lead to incorrect usage and conclusions. A minor difference exists in that at least one Air Force manual recommends that the JFACC command the overall interdicition effort, while none of the Army manuals reviewed mentioned command and control of the effort.

Joint and Service Doctrine Conformity

Army and proposed joint doctrine conform reasonably well. Army doctrine and joint doctrine describe similar end states and means to achieve them. Both recognize an operational level of warfare. Both seek a synergy between close and deep operations. Both identify a wide variety of systems which can be employed to conduct deep operations. Both stress the need to synchronize efforts.

However, Army doctrine does lack conformity with proposed joint doctrine in two basic areas. FM 100-5 does not require the integration of AI with fire and maneuver of ground forces, while both JCS Pub 3-03 (ID) and JCS Test Pub 3-03.1 do. The Army approach to integration found in FM 100-5 is appropriate when describing the need to integrate an operational activity (AI) with a tactical one (maneuver), but not so when discussing operational level interdiction and operational level maneuver. A second problem area concerns terminology. The Army uses the phrases deep operations and operational fires to describe the activities or actions which are labeled interdiction in joint doctrine. Only FM 6-20 comes close to the accepted usage of interdiction, but even it falls short by limiting interdiction to an Air Force mission.

Air Force doctrine conforms less well with proposed joint doctrine. Areas where they do conform include the coordination and command and control of interdiction operations. Both describe interdiction as normally deliberate pre-planned operations of a separate campaign well integrated into the overall theater campaign plan under the command of the JFACC.

The Air Force failure to recognize an operational level of warfare is the most serious breach of conformity. It creates a situation which separates Air Force doctrine from all others. As previously described, the interpolation required when comparing Air Force doctrine and others is not helpful, and jeopardizes the interoperability of forces. As with Army doctrine, the Air Force uses different terminology than joint doctrine, but the Air Force differences are more substantial. The Air Force has designated Air Interdiction as a mission, planned and conducted in virtual isolation, while proposed joint doctrine considers Air Interdiction as the most important element of an integrated interdiction campaign. This reflects the single-Service mission approach to warfighting that existed prior to recognition of an operational level of war and the increased emphasis on joint warfighting. Finally, the Air Force does not have a doctrinal publication devoted to interdiction. Unlike the Army, whose assets will probably never be employed unilaterally in interdiction operation, Air Force assets will frequently be employed unilaterally to conduct interdiction. Therefore, this represents a significant shortfall between the two doctrine.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The United States has doctrine for interdiction at the operational level of war, but it is fragmented. Joint doctrine for interdiction has not yet been approved by the JCS. Joint, Army and Air Force doctrine all use different terminology. Army and joint doctrine recognize an operational level of warfare, while Air Force doctrine does not. Air Force and joint doctrine are compatible in the area of command and control of interdiction, while the Army is not. While the ultimate goal of all three doctrine is to divert, disrupt, delay, or destroy enemy surface military potential before it can be used effectively against friendly forces, it is not possible to describe a single US doctrine for operational interdiction. The stage is set for significant problems should the need arise to execute operational interdiction.

With regard to the questions generated by General Starry's operational concept criteria in Chapter 1, US Army and Air Force doctrine for interdiction do address enemy follow-on forces and have recognized them as a particularly lucrative target for many years. More often described as targets for nuclear weapons because of their distance

from the close battle, and relative lack of other interdiction means, follow-on forces do not represent a "new" problem for the US military.

Interdiction was identified as a critical operation by the Army as early as 1954 and as a major mission by the Air Force since 1964, and remains so today. In fact, Army doctrine from the 1950's and early 1960's uses terminology and describes interdiction operations in ways that are much more compatible to current joint doctrine than current Army doctrine is. The current definition of interdiction is nearly verbatim to the 1954 definition used in FM 100-5. The 1962 FM 100-5 described the importance of all echelons of command planning for interdiction, with the higher echelons integrating the efforts and expanding the effects of subordinate elements, which is very similar to the actions desired in proposed joint doctrine.

This thesis did not examine interdiction technology, so it can not offer or support a conclusion based on evidence. However, it would appear that none of the Service and proposed joint doctrine is dependent on a particular weapon system or technology. Therefore, "new" technology does not appear to justify creating "new" doctrine. The thesis did not explore whether the FOFA operational concept had been tested, approved, and accepted.

Then why were NATO and the Joint Staff so concerned with creating a FOFA concept and generating interdiction doctrine for the operational level of war? The most likely answer centers on Soviet/Warsaw Pact perceptions. As mentioned in Chapter 1, treaty commitments have significantly affected the status quo in Europe. In an

attempt to redress a perceived force and capability imbalance, FOFA was used to generate new interest in conventional interdiction by the Alliance and demonstrate awareness of an exploitable operational weakness to the Soviets/Warsaw Pact. The US will benefit from the effort by acquiring cogent interdiction doctrine for the operational level of war, when and if the proposed joint doctrine is formally approved.

The FOFA concept and JCS Test Pub 3-03.1 go beyond a mere rewrite or formalization of interdiction doctrine, however. JCS Pub 3-03 (ID) and the various Army and Air Force manuals describe interdiction as a separate campaign working in consonance with other theater campaigns, but planned and executed independently. The FOFA concept and doctrine seek to provide theater and ground component commanders with the ability to employ interdiction assets against recently identified high value targets in near real time, which is largely precluded by standard interdiction doctrine. This ability would afford operational-level commanders with greatly increased flexibility and responsiveness, a condition which exists in Soviet/Warsaw Pact doctrine, but is lacking in US/NATO organizations. 1

Recommendations

The Department of Defense needs to establish and enforce a standard terminology for all operations. Lieutenant General John H. Cushman said that "we have become prisoners of our own terminology." 2 The "chains" that bind us can be removed with a little effort by primarily the Army and Air Force.

First, the Air Force needs to comply with its own policy of "continuously refin[ing] aerospace doctrine to make it relevant to present operations and viable for future contingencies" and update its doctrine to reflect the modern structure of warfare. 3 Doubts as to the utility of an operational level of warfare and reluctance to incorporate it into official Air Force doctrine were acceptable in 1984. 4 Now that it is officially sanctioned by DOD, the Air Force must update all of its doctrine to reflect the change.

Once the Air Force has adopted the modern structure of warfare, the next step is for it to modify its approach to Air Interdiction in support of joint interdiction. Under the aegis of the major Air Force mission of Air Interdiction, three subsets should be established: Strategic Air Interdiction, Operational Air Interdiction, and Tactical Air Interdiction. This provides more than a terminology fix. These labels are not only easily identified with the levels of warfare; they define what levels of coordination are required to plan and execute the operations. Strategic interdiction would require coordination with the National Command Authorities, operational interdiction with the theater

and other component commanders, and tactical interdiction with supported tactical commanders. This is not an original thought. 5 However, there is no longer time for debate; the Air Force must act now, in order to avoid further confusion.

The Army must also make changes to comply with current DOD terminology. The Army should continue to describe the close, deep, and rear operations of the modern battlefield. However, when describing how to perform deep operations at the operational level, it should use the term "interdiction" or phrase "operational interdiction" instead of "operational fires." Operational fires, especially the definition proposed by Lieutenant Colonel Carlos Langston, USA, describe the same operations that comprise interdiction, but the phrase does not conform with other doctrine. 6 The Army should adopt categories of fires similar to those recommended for Air Interdiction. Then there would be strategic, operational, and tactical fires in parallel to the three categories of Air Interdiction. Regardless of whether these recommendations are adopted, the Army must modify FM 6-20 to reflect Air Interdiction versus interdiction as a means to provide operational fires.

The Joint Staff also needs to modify some terminology. In keeping with the recommended changes to Service doctrine, joint doctrine should also recognize three categories of interdiction operations -- strategic, operational, and tactical. JCS Pub 3-03 would then be "Doctrine for Joint Operational Interdiction". In keeping with this change and in order to reflect the true goal of FOFA -- to provide

operational level commanders with more responsive means to conduct interdiction -- JCS Pub 3-03.1 would become "Doctrine for Joint Immediate Operational Interdiction".

While recommending changes to terminology, I would be remiss if I did not point out the potential for confusion caused by the overuse of the term "campaign". Campaign should be the term used to describe the overall operational level activity planned by a JTF commander or CINC. Subsets of the overall campaign, such as interdiction, should be labeled "operations". This would not only reduce confusion but also correspond nicely with the level of warfare that they are aligned with.

Getting away from terminology, the Air Force should add a little "depth" to its doctrine. Some authors praise the Air Force for keeping its doctrine clean of "puffery." 7 Others recognize the need to provide additional information in order to ensure a more thorough understanding of intent. Lieutenant Colonel Price T. Bingham, USAF, who described Air Force interdiction doctrine as being "shallow at best," offers the best advice on how to improve interdiction doctrine. He calls for the Air Force and the Army to better "explain how Air Interdiction and land maneuver should be integrated in order to create the powerful synergies that can lead to theater success." 8 This explanation should be more than a TTP or rewrite of J-SAK, and address enemy vulnerabilities, joint command and control, and the criticality of timing between interdiction operations and ground maneuver. Depth would also be afforded by including historical examples of interdiction operations. The Army's use of historical examples of operations helps to establish a frame of

reference that can be used to clarify a concept or serve as a basis of comparison of current versus past approaches.

Joint doctrine also needs to acquire more depth. While JCS Test Pub 3-0 is supposed to be the capstone doctrine for joint operations, it virtually ignores operations! It needs to provide a framework for joint operations, to include interdiction. It does not need to be the joint equivalent of FM 100-5 or AFM 1-1. FM 100-6 (CD) uses a much better format for a manual about operations, and includes historical examples of the various operations discussed.

All joint and Service doctrine for interdiction should be revised to reflect the importance of synchronization of interdiction operations on the battlefield. Since all component commanders of a joint force have interdiction resources, unity of effort and focus is critical. Synchronization of interdiction efforts and synchronization of interdiction with other campaigns is vital in order to avoid fragmented, duplicated, and conflicting efforts.

In order to synchronize interdiction efforts into a viable theater interdiction operation, centralized command and control is advisable. Since the majority of interdiction assets in a theater belong to the air component, the JFACC is probably the best individual for the job. Ground component commanders should not be alarmed by this recommendation. Remember that all interdiction will now be integrated into the overall theater campaign plan; control over a relatively small number of assets is being exchanged for effective interdiction in consonance with the ground operation.

Finally, additional research related to operational interdiction should be conducted. Areas which need to be addressed include: the history of operational interdiction and lessons learned, analysis of command and control for operational interdiction, and world-wide target analysis.

ENDNOTES

1 John G. Hines and Phillip A. Petersen, "Is NATO Thinking Too Small?", International Defense Review, No. 5, 1986.

2 Lieutenant General John H. Cushman, USA, Ret., Organization and Operational Employment of Air/Land Forces, Carlisle Barracks, PA, United States Army War College, 1983, page 7-6.

3 Air Force Manual 1-1, Basic Aerospace Doctrine of the United States Air Force, Washington, D.C., Department of the Air Force, 1984, page vii.

4 Colonel Clifford R. Krieger, USAF, "USAF Doctrine: An Enduring Challenge," Air University Review, Vol. XXXV, No. 6, September-October 1984, page 23.

5 Lieutenant Colonel Donald J. Alberts, USAF, "An Alternative View of Air Interdiction," Air University Review, Vol. XXXII, No. 5, July-August 1981, page 34.

6 Lieutenant Colonel Carlos Langston, USA, "Operational Fires," A Defense Analytical Study, US Air War College, Maxwell AFB, May 1989, page 10.

7 Editorial, "Unfinished Business," Air University Review, Vol. XXXV, No. 6, September-October 1984, page 3.

8 Lieutenant Colonel Price T. Bingham, USAF, Air Power and the Defeat of a Warsaw Pact Offensive: Taking a Different Approach to Air Interdiction in NATO, Maxwell AFB, AL, Air University Press, 1987, page 27.

APPENDIX ONE
FOFA ARGUMENTS

In the wake of NATO's work on the FOFA concept, numerous articles have been written concerning its value. The following are a representative sample of such articles presented in chronological order based on when they were written.

Major Hamblin, USAF, wrote about a "better way to win a war in Europe" in the September-October 1980 issue of the Air University Review. He discussed Soviet/Warsaw Pact offensive doctrine and the strengths and weaknesses of echelonment. He argued that echelonment should not be confused with reserves and that in order for the NATO defense to be successful it must defeat the first echelon in the close battle and the second echelon before it ever gets to the close battle. He concluded that for NATO to win, it must fight on the "plains between Magedeburg and Berlin [vice] Hanover and Aachen." 1

Mark Stewart, a columnist for the Armed Forces Journal International (AFJI), wrote the first of a series of articles on FOFA in the September 1982 issue of AFJI. In it he expressed concern that FOFA is overly dependent on "revolutionary" technology which is not yet available. He argued that FOFA is just another "doctrinal response avoiding the need for a large conventional force." Finally, he discussed the difficulty in targeting enemy second echelon forces and concluded that "it is difficult to envision a weapons concept that could not be employed more efficiently against forward echelons than against rear echelons." 2

General Franz-Joseph Schulze, GA, in a letter to the editor published in the December 1982 AFJI, cautioned against the thinking "strike deep" or FOFA was a new NATO strategy. He pointed out that disrupting the second echelon formations of attacking Warsaw Pact armies was an integral part of NATOs flexible response since MC 14/3 was drafted. He cautioned that semantics could lead to trouble, particularly if the FOFA concept was interpreted as a new offensive oriented approach instead of a refinement of extant doctrine. 3

Colonel Dupuy, USA (Ret), argued vehemently against a FOFA concept in an article in the January 1983 AFJI. He asserted that FOFA is "seriously oversimplistic, and igonores some grim aspects of reality." He argued that the basic assumption of FOFA is that the Soviets and Warsaw Pact are "a bit stupid" and will adhere rigidly to the doctrines that FOFA seeks to exploit. COL Dupuy warned that the Soviets should not be taken lightly, and that FOFA could result in a "self-delusion that would make a Warsaw Pact victory even more likely than it is now." 4

General Rogers, USA, wrote in the February/March 1983 NATO's Sixteen Nations about the Warsaw Pact doctrine of commiting forces in successive waves, attempting to maintain a constant pressure on the defender and mass sufficient forces for a breakthrough. He asserted that the objective of FOFA is to prevent or reduce the influence of follow-on forces in the battle at the FEBA. He allowed that intensive intelligence efforts are required to make FOFA work, but indicated that

NATO already has the minimum resources necessary to make FOFA work. Likewise, attack capabilities were also available. He concluded that the FOFA concept was consistent with the strategy of Flexible Respnse and enhanced Forward Defense. He stated that by combining the capability to blunt the leading echelon with an ability to delay, disrupt and ultimately prevent the advance of follow-on echelons, NATO better deterred a Warsaw Pact attack. 5

In September 1983, AFJI ran an interesting series of articles concerning the "Second-Echelon Attack." Mark Stewart and Joseph Forbes sparred with each other over the relative priority of a FOFA-like concept. Forbes argued that such a concept is a practical application of the principle of mass, "[i]f a commander is engaging the enemy while the enemy's reinforcements are on the way, and he can disrupt the combining and concentration of the enemy by alloting a fraction of his own force to that mission, why wouldn't he be wise to do so?" Stewart countered that we have long planned to use tactical air in an interdiction role and that his basic concern was self-delusion over how effective new technology used against second echelons will be. 6

In the November 1983 issue of AFJI, Dr. Tim Alexander Meyers related the successful Israeli defense of the Golan to the Forward Defense strategy of NATO. He discussed the essential elements of Forward Defense and avowed that the "nature of the Soviet offensive requires NATO's success with the concurrent echelon battle...[s]uccessful FEBA defense protects the means to attack the

follow-on forces in enemy territory, while striking deep will keep manageable force ratios at the FEBA." 7

In the same issue of AFJI, Jeffrey Record observed that FOFA "does not address, much less resolve, the principal deficiencies in NATO's present conventional force posture...and begs the question of foward defense's vulnerability to collapse at the hands" of first ehelon forces. With regard to the implementation/execution of FOFA, Record noted that it had "jarring implications for the traditional roles and missions of the US Army and Air Force." He concluded that even with problems, FOFA is good because it represents "an attempt to breathe life into a doctrine of flexible response whose actual flexibility under fire long ceased to be apparent." 8

In the November/December 1984 issue of NATO's Sixteen Nations, Frederick Bonnart reviewed General Roger's FOFA concept and concluded that there is nothing "revolutionary" about it and that the "concept of cutting off your adversary from his reserves and defeating him in detail is as old as warfare itself." 9

General Rogers, writing in the December 1984 issue of the NATO Review and reprinted in the Summer 1985 edition of Parameters, provided insight into why he began to push for the FOFA concept and tried to debunk various myths about FOFA. FOFA was developed to reduce "to a manageable ratio with conventional weapons the number of enemy forces arriving at ourt General Defense Position." Enhanced air interdiction

capabilities were seen as the best way to accomplish this objective. The name "Follow-on Forces Attack" was adopted because it best described the target and action involved. 10

In the Summer 1987 issue of Airpower Journal, General Charles L. Donnelly, Jr., USAF (Ret) discussed his views on theater level air power. As the former CINC of US Air Forces Europe (USAFE) and commander of Allied Air Forces Central Europe (COMAAFCE), he was more than qualified to offer opinions. He discussed the importance of centralized control and decentralized execution of air power, and provided insight into the organization of USAFE and AAFCE. With regard to FOFA, he argued that the FOFA concept was simple and should not cause alarm in the Air Force. He stated that "FOFA is the epitome of a concept at the operational level. It is a new term, but the concept is not new...FOFA is and has been largely accomodated by the air-interdiction mission." 11

ENDNOTES

1 Major Leslie J. Hamblin, USAF, "Yes, There Really IS a Better Way to Win a War in Europe," Air University Review, Vol. XXXI, No. 6, September-October 1980, p. 82.

2 Mark Stewart, "Second-Echelon Attack: Is the Debate Joined?", Armed Forces Journal International, September 1982, pp. 105-113.

3 General a. D. Franz-Joseph Schulze, ""Strike Deep" is NOT a 'New' NATO Strategy," Armed Forces Journal International, December 1982, page 6.

4 Colonel Trevor N. Dupuy, USA (Ret), "Why Strike Deep Won't Work," Armed Forces Journal International, January 1983, p. 56.

5 General Bernard W. Rogers, "Sword and Shield - ACE Attack of Warsaw Pact Follow-on Forces," NATO's Sixteen Nations, Vol. 28, No. 1, February/March 1983, p. 18.

6 Mark Stewart, and Joseph Forbes, "The Second Echelon Attack Debate Rages On," Armed Forces Journal International, September 1983, pp. 104-106.

7 Dr. Tim Alexander Meyers, "NATO: Can the Alliance Be Saved?", Armed Forces Journal International, November 1983, p. 38.

8 Dr. Jeffrey Record, "Defending Europe Conventionally: An American Perspective on Needed Reforms," Air University Review, Vol. XXXVI, No. 6, September-October 1985, p. 48.

9 Frederick Bonnart, "Follow-on Forces Attack," NATO's Sixteen Nations, Vol. 29, No. 7, November/December 1984, p. 51.

10 General Bernard W. Rogers, "Follow-on Forces Attack (FOFA): Myths and Realities," Parameters, Vol. XV No. 2, Summer 1985, pp. 75-79.

11 General Charles L. Donnelly, Jr., USAF, (Ret), A Theater-Level View of Air Power, Airpower Journal, Summer 1987, page 6.

APPENDIX TWO
GLOSSARY

Air Interdiction. Air operations conducted to destroy, neutralize, or delay the enemy's military potential before it can be brought to bear effectively against friendly forces at such distance from friendly forces that detailed integration of each air mission with the fire and movement of friendly forces is not required. (JCS Pub 1-02)

Battlefield Air Interdiction. Air action against hostile surface targets which are in a position to directly affect friendly forces and which requires joint planning and coordination. While BAI requires coordination in joint planning, continuous coordination may not be required during the execution stage. (FM 101-5-1)

Campaigns. A sequence of related military operatons designed to achieve strategic or operational objectives within a given time and space. (JCS Test Pub 3-0)

Center of Gravity. The characteristic, capability, or locality from which a military force derives its freedom of action, physical strength, or will to fight. It exists at the strategic, operational, and tactical levels of war. (JCS Test Pub 3-0)

Close Air Support. Air action against hostile targets that are in close proximity to friendly forces and that requires detailed integration of each air mission with the fire and movement of those forces. (FM 101-5-1)

Deep Battle. All actions which support the friendly scheme of maneuver and which deny to the enemy commander the ability to employ his forces not yet engaged at the time, place, or in the strength of his choice. (FM 101-5-1)

Doctrine. Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application. (JCS Pub 1-02)

Fire Support Coordination Line. A line established by the appropriate ground commander to ensure coordination of fire not under his control but which may affect current tactical operations. The FSCL is used to coordinate fires of air, ground, or sea weapons systems using any type of ammunition against surface targets. The FSCL should follow well defined terrain features. The establishment of the FSCL must be coordinated with appropriate tactical air commander and other supporting elements. Supporting elements may attack targets forward of the FSCL, without prior coordination with the ground force commander, provided the attack will not produce adverse surface effects on, or to the rear of, the line. Attacks against surface targets behind this line must be coordinated with the appropriate ground force commander. (FM 101-5-1)

Follow-on Forces. Follow-on forces are enemy ground forces not yet engaged in the battle, the logistics and other support forces sustaining them, the command and control communications centers used to direct their movement and deployment, and locations through which these forces move and from which they are supported. (JCS Test Pub 3-03.1)

Interdiction. An action to divert, disrupt, delay or destroy the enemy's surface military potential before it can be used effectively against friendly forces. (JCS Pub 1-02)

Joint Doctrine. Fundamental principles that guide the employment of forces of two or more Services in coordinated action toward a common objective. It will be promulgated by the Joint Chiefs of Staff. (JCS Pub 1-02)

Multi-Service Doctrine. Fundamental principles that guide the employment of forces of two or more Services of the same nation in coordinated action toward a common objective. It is ratified by two or more Services, and is normally promulgated in mult-Service publications that identify the participating Services, e.g., Army-Navy doctrine, Army-Air Force tactics, techniques, and procedures. (JCS Pub 1-01)

Offensive Air Support. That part of tactical air support of land operations that consists of tactical air reconnaissance, battlefield air interdiction, and close air support, which are conducted in direct support of land operations. (FM 101-5-1)

Operational Level of War. The level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or areas of operations. Activivites at this level link tactics and strategy by establishing operational objectives needed to accomplish the strategic objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited to achieve strategic objectives. (JCS Pub 1-02)

Tactical Level of War. The level of war at which battles and engagements are planned and executed to accomplish military objectives assigned to tactical units or task forces. Activities at this level focus on the ordered arrangement and maneuver of combat elements in relation to each other and to the enemy to achieve combat objectives. (JCS Pub 1-02)

Tactics. 1. The employment of units in combat. 2. The ordered arrangement and maneuver of units in relation to each other and/or to the enemy in order to utilize their full potentialities. (JCS Pub 1-02)

Tactics, Techniques and Procedures. The actions and methods which implement doctrine and describe how forces will be employed in operations. (JCS Pub 1-02)

Joint Tactics, Techniques and Procedures. The actions and methods which implement joint doctrine and describe how forces will be employed in joint operations. They will be promulgated by the Joint Chiefs of Staff. Also called JTTP. (JCS Pub 1-02)

Strategic Level of War. The level of war at which a nation or group of nations determines national or alliance security objectives and develops and uses national resources to accomplish those objectives. Activities at this level establish national and alliance military objectives; sequence initiatives; define limits and assess risks for the use of military and other instruments of power; develop global or theater war plans to achieve those objectives; and provide armed forces and other capablities in accordance with the strategic plan. (JCS Pub 1-02)

BIBLIOGRAPHY

Books

Bingham, Price T.. Air Power and the Defeat of a Warsaw Pact Offensive: Taking a Different Approach to Air Interdiction in NATO. Maxwell AFB, AL: Air University Press, 1987.

Bingham, Price T.. Ground Maneuver and Air Interdiction in the Operational Art. Maxwell AFB, AL: Air University Press, 1989.

Bowie, Professor Robert R.. Strengthening Conventional Deterrence in Europe. New York, NY: St. Martin's Press, 1983.

Buteux, Paul. Strategy, Doctrine, and the Politics of Alliance. Boulder, CO: Westview Press, 1983.

Cushman, Lieutenant General John H., USA (Ret). Organization and Operational Employment of Air/Land Forces. Carlisle Barracks, PA: United States Army War College, 1984.

DeSeversky, Alexander P. Air Power: Key to Survival. New York, NY: Simon and Shuster, 1950.

Dews, Edmond and Kozaczka, Felix. Air Interdiction: Lessons from Past Campaigns. Santa Monica, CA: Rand, 1981.

Doughty, Major Robert A., USA. "The Evolution of US Army Tactical Doctrine, 1946-76," Leavenworth Papers, No. 1. Fort Leavenworth, KS: Combat Studies Institute, USACGSC, August 1979.

Dupuy, R. Ernest and Dupuy, Trevor N.. Military Heritage of America. New York, NY: McGraw-Hill Book Company, Inc., 1956.

Earle, Edward Mead. Makers of Modern Strategy. Princeton, NJ: Princeton University Press, 1973.

Fuller, Major General J.F.C. The Conduct of War, 1789-1961. New Brunswick, NJ: Rutgers University Press, 1961.

Goldberg, Alfred. A History of the United States Air Force 1907-1957. Princeton, NJ: D. Van Nostrand Company, Inc., 1972.

Hagen, Lawrence S.. The Crisis in Western Security. New York, NY: St. Martin's Press, 1983.

Heilbrunn, Otto. Conventional Warfare in the Nuclear Age. London, UK: George Allen and Unwin, Ltd., 1965.

Heilbrunn, Otto and Dixon, Brigadier C.A. Warfare in the Enemy's Rear. London, UK: George Allen and Unwin, Ltd., 1963.

House, Jonathan M.. Toward Combined Arms Warfare: A Survey of 20th-Century Tactics, Doctrine, and Organization. FT Leavenworth, KS: U.S. Army Command and Staff College, 1984.

Kaplan, Lawrence S.. NATO and the Policy of Containment. Lexington, MA: D. C. Heath and Company, 1971.

Killebrew, Lieutenanat Colonel Robert B., USA. Conventional Defense and Total Deterrence. Willimington, DE: Scholarly Resources Inc., 1986.

Kohn, Richard H. and Harahan, Joseph P.. Air Power: Air Superiority in World War II and Korea. Washington, DC: Office of Air Force History, 1983.

Kohn, Richard H. and Harahan, Joseph P.. Air Interdiction in World War II, Korea, and Vietnam. Washington, DC: Office of Air Force History, 1986.

London, Herbert I.. Military Doctrine and the American Character. New Brunswick, CT: Transaction Books, 1984.

Mako, William P.. U.S. Ground Forces and the Defense of Central Europe. Washington, DC: The Brookings Institute, 1983.

Military History Symposium. Air Power and Warfare. Washington, DC: Office of Air Force History, 1979.

Momyer, William W.. Air Power in Three Wars. Washington, DC: Department of the Air Force, 1978.

Romjue, John L.. From Active Defense to AirLand Battle: The Development of Army Doctrine 1973-1982. FT Monroe, VA: Historical Office, United States Army Training and Doctrine Command, 1984.

Smith, Brigadier General Dale O., USAF. US Military Doctrine. New York, NY: Duell, Sloan and Pearce, 1955.

Stein, David J., Nolan, Kimberly, and Perry, Robert. "Process and Problems in Developing NATO Tactical Air Doctrine," A RAND Note. Santa Monica, CA: The RAND Corporation, June 1988.

United States Air Force Historical Division. The Army Air Forces in World War II, Vol. II and III. Chicago, IL: University of Chicago Press, 1951.

Von Mellenthin, F.W. and Stolfi, R.H.S.. NATO Under Attack. Durham, NC: Duke University Press, 1984.

Weigley, Russell F.. History of the United States Army. New York, NY: Macmillan Publsihing Co., Inc., 1967.

Westmeyer, Paul.. A Guide For Use In Planning and Conducting Research Projects. Springfield, IL: Charles C. Thomas, Publisher, 1981.

Government Documents

Air Force Manual 1-1, United States Air Force Basic Doctrine. Washington, DC: Department of the Air Force, 1964.

Air Force Manual 1-1, United States Air Force Basic Doctrine. Washington, DC: Department of the Air Force, 1971.

Air Force Manual 1-1, United States Air Force Basic Doctrine. Washington, DC: Department of the Air Force, 1975.

Air Force Manual 1-1, Functions and Basic Doctrine of the United States Air Force. Washington, DC: Department of the Air Force, 1979.

Air Force Manual 1-1, Basic Aerospace Doctrine of the United States Air Force. Washington, DC: Department of the Air Force, 1984.

Air Force Manual 1-2, United States Air Force Basic Doctrine. Washington, DC: Department of the Air Force, 1953.

Air Force Manual 1-2, United States Air Forces Basic Doctrine. Washington, DC: Department of the Air Force, 1955.

Air Force Manual 1-2, United States Air Force Basic Doctrine. Washington, DC: Department of the Air Force, 1959.

Field Manual 6-20, Fire Support in the AirLand Battle. Washington, D.C., Department of the Army, 1988.

Field Manual 100-5, Operations. Washington, DC: Department of the Army, September 1954.

Field Manual 100-5, Operations. Washington, DC: Department of the Army, February 1962.

Field Manual 100-5, Operations. Washington, DC: Department of the Army, March 1976.

Field Manual 100-5, Operations. Washington, DC: Department of the Army, August 1982.

Field Manual 100-5, Operations. Washington, DC: Department of the Army, May 1986.

Field Manual 100-6, Large Unit Operations(Coordinating Draft). Washington, DC: Department of the Army, September 1987.

Field Manual 100-15, Corps Operations (Approved Final Draft). Washington, D.C.: Department of the Army, November 1988.

Field Manual 101-5-1, Operational Terms and Symbols. Washington, D.C.: Department of the Army, October 1985.

JCS Pub 1-02, DOD Dictionary of Military and Associated Terms. Washington, DC: The Joint Chiefs of Staff, 1986.

JCS Pub 1-01, Joint Publicaton System (Joint Doctrine and Joint Tactics, Techniques, and Procedures Development Program). Washington, DC: The Joint Chiefs of Staff, 1988.

JCS Test Pub 3-0, Doctrine for Joint Operations. Washington, D.C.: The Joint Chiefs of Staff, 1989.

JCS Pub 3-03, Doctrine for Joint Interdiction Operations (Initial Draft). Washington, D.C.: The Joint Chiefs of Staff, 1989.

JCS Test Pub 3-03.1, Joint Interdiction of Follow-on Forces [Follow-on Forces Attack, FOFA)]. Washington, DC: The Joint Chiefs of Staff, 1988.

Tactical Air Command Manual 2-1, Tactical Air Operations. Langley Air Force Base, VA: United States Air Force Tactical Air Command, 1978.

United States Code, Title 10, "Armed Forces". Washington, D.C.: The Congress of the United States of America, 1989.

USACGSC RB 100-2, Vol I, Selected Readings in Tactics, The 1973 Middle East War. Fort Leavenworth, KS: U. S. Army Command and General Staff College, March 1980.

USACGSOC Subcourse P511, Joint and Combined Environments. Fort Leavenworth, KS: Department of Joint and Combined Operations, AY 1989-90.

USAWC Reference Text, NATO Armed Forces. Carlisle Barracks, PA: U.S. Army War College, 1987.

Periodicals and Articles

Alberts, Lieutenant Colonel Donald J., USAF. "An Alternative View of Air Interdiction," Air University Review, Vol. XXXIII, No. 5, July-August 1981, pp. 31-44.

Bonnart, Frederick. "Follow-on Forces Attack," NATO's Sixteen Nations, Vol. 29, No. 7, November/December 1984, pp. 49-51.

Canby, Dr. Steven L. "Tactical Airpower in Armored Warfare," Air University Review, No. 8, 1978, pp. 1275-1276.

Cordesman, Anthony H. and Schemmer, Benjamin F.. "An Exclusive AFJ Interview with General Bernard W. Rogers," Armed Froces Journal International, September 1983. pp. 72-84.

Dick, Charles J. "Tactical Airpower on the Battlefield of Tomorrow: The Search for A Mission," RUSI, Journal of the Royal United Services Institute for Defensive Studies, June 1978, pp. 42-45.

Dinges, Brigadier General Edward A., USA, and Sinnreich, Major Richard H., USA. "Battlefield Air Interdiction: Old Term, New Problem," Field Artillery Journal, Jan-Feb 1980. pp.14-17.

Donnelly, General Charles L., Jr., USAF (Ret). "A Theater-Level View of Air Power," Airpower Journal, Summer 1987, pp. 3-8.

Dupuy, Colonel Trevor N., USA (Ret). "Why Strike Deep Won't Work," Armed Forces Journal International, January 1983. pp. 56-57.

Editor, Air University Review. "Unfinished Business," Air University Review, Vol. XXXV, No. 6, September-October 1984, pp. 2-3.

Galvin, General John R., USA. "Allied Command Europe," NATO's Sixteen Nations, Vol. 32, No. 3, August 1987, pp. 14-16.

Hamblin, Major Leslie J., USAF. "Yes, There Really IS a Better Way to Win a War in Europe," Air University Review, Vol. XXXI, No. 6, September-October 1980, pp. 70-82.

Hines, John G., and Petersen, Phillip A.. "Is NATO Thinking Too Small," International Defense Review, No. 5, March 1986.

Holder, Colonel L.D., USA. "A New Day for Operational Art," Army, March 1985, pp. 21-32.

Karber, fPhillip A.. "The Military Impact of the Gorbachev Reductions," Armed Forces Journal International, January 1989, pp. 54-64.

Krieger, Colonel Clifford R., USAF. "USAF Doctrine: An Enduring Challenge," Air University Review, Vol. XXXV, No. 6, September-October 1984, pp. 16-25.

Loon, Henry van. "An Exclusive AFJ Interview with General John R. Galvin," Armed Forces Journal International, March 1988, pp. 50-52.

Meyers, Dr. Tim Alexander. "NATO: Can the Alliance Be Saved?", Armed Forces Journal International, November 1983, pp. 32-40.

Milam, John H. and Palmer, Diego A. Ruiz. "'Conventional Forces in Europe' What's in the Graphs?", Armed Forces Journal International, January 1989, pp. 47-52.

Ratley, Captain Lonnie O.. "A Lesson for Today? Air Power at Kursk," RUSI, Journal of the Royal United Services Institute for Defensive Studies, June 1977, pp. 58-62.

Record, Dr. Jeffrey. "Defending Europe Conventionally: An American Perspective on Needed Reforms," Air University Review, Vol. XXXVI, No. 6, September-October 1985, pp. 55-64.

Rogers, General Bernard W.. "Sword and Shield - ACE Attack of Warsaw Pact Follow-on Forces," NATO's Sixteen Nations, Vol. 28, No. 1, February/March 1983, pp. 16-26.

Rogers, General Bernard W.. "Follow-on Forces Attack: Myths and Realities," Parameters, Vol. XV No. 2, Summer 1985, pp. 75-79.

Rogers, General Bernard W.. "The 'Strike Deep' Initiative," Armed Forces Journal International, January 1983, p. 5.

Schemmer, Benjamin F.. "NATO's New Strategy: Defend Forward, But STRIKE DEEP," Armed Forces Journal International, November 1982, pp. 50-68.

Schulze, General Franz-Joseph. "'Strike Deep' is Not a New NATO Strategy," Armed Forces Journal International, December 1982, p. 6.

Stewart, Mark. "Second-Echelon Attack: Is the Debate Joined?" Armed Forces Journal International, September 1982, pp. 105-113.

Stewart, Mark and Forbes, Joseph. "The Second Echelon Attack Debate Rages On," Armed Forces Journal International, September 1983, pp. 104-106.

Unpublished Materials

Burke, Lieutenant Colonel Charles M., USA. "Army Doctrine--AirLand Battle." Information paper, prepared for the Office of the Deputy

Chief of Staff for Operations, Department of the Army (DAMO-FDQ). Washington, D.C., 28 April 1989.

Busico, Major Roger P., USAF. "Battlefield Air Interdiction: Airpower for the Future." Masters Thesis, US Army Command and General Staff College. FT Leavenworth, KS, 1978.

Dalecky, Major William J., USAF. "Battlefield Air Interdiction by the Luftwaffe at the Battle of Kursk, 1943." Masters Thesis, US Army Command and General Staff College. FT Leavenworth, KS, 1980.

Entwistle, Major Thomas D., USAF. "Lessons from Israeli Battlefield Air Interdiction During the Battle for Golan, October 1973." Master's Thesis, US Army Command and General Staff College. FT Leavenworth, KS, 1988.

Hamilton, Major David, USAF. "Close Air Support and Battlefield Air Interdiction in the AirLand Battle." Masters Thesis, US Army Command and General Staff College. FT Leavenworth, KS, 1980.

Langston, Lieutenant Colonel Carlos, USA. "Operational Fires." A Defense Analytical Study, US Air War College, Maxwell AFB, AL, 1989.

Merrill, Major Frank J., USAF. "A Study of the Aerial Interdiction of Railways During the Korean War." Masters Thesis, US Army Command and General Staff College, FT Leavenworth, KS, 1965.

Poole, Major Thomas B., USAF. "The Effects of Interdiction in World War II: The European Theater of Operations." Masters Thesis, US Army Command and General Staff College, FT Leavenworth, KS, 1984.

Streater, Major Donald A., USAF. "Airpower Theory and Application: An Historical Perspective." Masters Thesis, US Army Command and General Staff College, FT Leavenworth, KS, 1969.

INITIAL DISTRIBUTION LIST

Combined Arms Research Library
U.S. Army Command and General Staff College
Fort Leavenworth, Kansas 66027-6900

Defense Technical Information Center
Cameron Station
Alexandria, Virginia 22314

Air University Library
USAF Air University
Maxwell Air Force Base, Alabama 36112

Major Richard P. McKee
409 Chanticleer
Clovis, New Mexico 88101

Lieutenant Colonel Thomas E. Smith
Joint Doctrine Division, CTAC
USACGSC
Fort Leavenworth, Kansas 66027-6900

Colonel (P) Gerald A. Miller
1533 Carroll Avenue
Ames, Iowa 50010-5654